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JOURNAL OF THE American Veterinary Medical Association

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AMERICAN VETERINARY REVIEW
(Original Official Organ U. S. Vet. Med. Ass'n)
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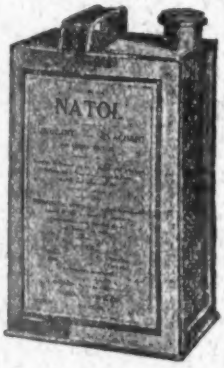

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PIERRE A. FISH, Editor **ITHACA, N. Y.**

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VOL. LII., N. S. VOL. V. NOVEMBER, 1917. No. 2.

UNITED SUPPORT

Diplomatic evidence has revealed that cesspools of intrigue have been dug within our boundaries by the enemies of our country, and malodorous trails ramify from them in various directions. Certain pacifists and idealists, intentionally or unintentionally, have stumbled along some of these trails. Some, perhaps, do not love their country less, but their own pet theories more. While the vast conflagration of war is raging, they question the wisdom of laying the hose or coupling with the hydrant, even when the flames are advancing toward their own habitations. Some seemingly argue that they should not become active until their own homes are aflame, and some even incomprehensibly question the ethics of action, apparently being incapable of realizing that they are giving "aid and comfort" to the forces of destruction.

The pacifists are the fleas of the nation. They render the life of the host unpleasant. They may do more. The rat flea harbors the deadly germ of the bubonic plague. The pacifists, contaminated with the trail of enemy intrigue, may harbor the deadly germ of treason. An infected flea is dangerous. Unless isolated or destroyed, its power for harm is unlimited. An infected pacifist needs—attention.

Diplomatic evidence has also revealed that the enemy, who forced war upon us, is rated high in efficiency but low in integrity;

an enemy who scorns to confine his activities to high explosives but includes among his allies the low but deadly anthrax germs. When pathogenic germs are advocated for limiting or cutting off the food supply it is time for veterinarians to take notice. Unfortunately the enemy has many unconscious allies working for him in this country in the germ family. The germs are impartial as to *their* allies. They have fought us in the past and will continue to do so in the future, and their ravages among the food animals unquestionably give "aid and comfort" to the enemy to our detriment. It is a battle with germs as well as with Germans.

Viewed from this standpoint the veterinarian looms large in the war in which the food supply is such a conspicuous factor. United support and cooperation between federal and state administrations and individual veterinarians may accomplish more than has hitherto been attained. We cannot expect rapid extermination, but the veterinarian, who can reduce markedly the ravages of hog cholera, tuberculosis, contagious abortion, parasitic and other afflictions which menace our live stock, is contributing as much service to his country as the general who wins a victory upon the battlefield. In the peaceful past we have suffered, with equanimity, losses that now will hurt us much. Under the stress of the occasion and with more concentrated and correlated energy more gain may be made.

To show how far reaching the problem is, it may be stated, upon the authority of the Food Administration, that even before the war the world was strained to meet the demand for animal products because of the ascending standard of living. The war has caused an already difficult situation to become more difficult. The diversion of productive labor into war channels has greatly diminished the production of fodder in all of the countries at war; its importation has been curtailed or checked because of shortage in shipping, with the result that, for lack of it, many animals have been killed, and those that survive, because of reduced and inferior rations, have greatly diminished their output. In face of this diminution, there is an increased demand for animal products on the part of millions of individuals, who must have them by necessity of extreme physical labor in the production of war materials. Likewise, the supply of wool and leather has decreased at a time when there are additional demands for these supplies which must be met, for clothing and materials for the soldiers.

A careful estimate, as regards animals, is shown in the following table:

		United States		Western Allies
cattle	increased	7,090,000	decreased	8,420,000
sheep	decreased	3,000,000	decreased	17,500,000
hogs	increased	6,275,000	decreased	7,100,000
			Total	33,020,000

The problem is not only to supply the needs of the allies, but to face an increasing demand with a diminishing supply while the war goes on, and safeguard as far as possible against animal bankrutpcy after the war is over. The candle is burning at both ends and will so continue until peace arrives. The earlier the victory, the sooner adjustments can be made. United support is essential, intranationally as well as internationally, to suppress the downward tendency of the animal supply. Its progress may at least be retarded if sufficient effort is made.

Let pacifists disentangle themselves from their cloudy theories; let them visualize an united country fighting in one of the holiest wars ever waged for the divine rights of humanity; let them realize that U. S. stands not only for the United States but for United Support and that means Us—all of us.

P. A. F.

EUROPEAN CHRONICLES

Bois Jerome.

LYMPHANGITIS — INCUBATION — VACCINOTHERAPY — BACTERIOTHERAPY.—Our journals on the continent are full of these subjects; the epizootic and the ulcerous forms of the disease. I will gather the points that are of actual interest, omitting the various forms of treatment, to many of which I have already alluded in other chronicles. First from the *Revue Générale,* I will consider the question of the localization and duration of the evolution from a report of Major Velu, who has attended three hundred cases of epizootic lymphangitis.

In 113 cases the disease started on the trunk. The legs were attacked only in 19.33% of the treated cases. The hind extremities being affected more than the anterior. The head was affected in

16%, the shoulders in 11.66%, and the chest in 7%. The lesions of the mucous membranes proved the most rebellious to treatment; their healing occurred after a treatment of four months. The lesions of the legs required 3 or 4 months for cures.

The lymphangitis of the lumbar region, of the chest and shoulder regions required three months for their evolution.

Local troubles of the head and neck are comparatively benignant and generally give way to the treatment of six weeks.

According to Mr. Chapron the period of incubation may vary between 80 and 120 days. From a work published recently on the determination of the period of incubation of epizootic lymphangitis in France, it is said that the average statistics of closely observed cases the period of the epizootic form of the disease can be counted at about 118 days. This may, however, be decreased but not lower than 108 days.

The facts presented above have their own interest but do not take precedence over two others which are found in our professional and scientific papers, and which refer one to the epizootic lymphangitis, and the other to the ulcerous. The articles to which I refer are one from Veterinary Major Velu on the curative treatment of epizootic lymphangitis by *vaccinotherapy*. The other is by Veterinary Major C. Truche, Assistant to the Pasteur Institute, on the treatment of ulcerous lymphangitis by *bacteriotherapy*.

Let us consider both briefly.

VACCINOTHERAPY.—The vaccine used by Major Velu is a polyvalent anticryptococcic pyovaccine, which, when prepared, is used subcutaneously in proper dosage, so as to produce, more or less rapidly, a reaction of the organism, and is indicated by very marked clinical signs on the level of the specific lesions.

According to the author, there is first a *negative stage* which is an aggravation of the symptoms and which lasts 3 or 4 and sometimes 5 or 6 days with an intensity which varies with the dose of the vaccine and then is followed by a *passive stage* in which conditions change, all the symptoms undergoing manifestations of improvement. This stage lasts 4 or 5 or again may run to 10 days and when its effects have subsided the disease takes anew its normal course, when another injection may give rise to the development of the same series of phenomena.

The article of Major Velu gives the detailed description of a few cases where he has experimented and offers the following conclusions:

1. After the first injection of the vaccine, the negative stage is immediate; it lasts from 2 to 5 days according to the dose given.

2. The following positive stage is longer, it varies also, with the dose injected, up to 10 days and lasts on an average from 5 to 6 days.

3. After the end of the positive stage, the disease resumes its normal course, about 5 to 6 or 15 days after the injection of the vaccine.

4. A second injection, made during the negative stage, gives rise to a lasting aggravation of the disease.

5. When made at the end of the positive stage it is followed by the appearance of phenomena absolutely identical to those that follow the initial injection.

6. When made at the proper time, towards the end of the positive stage, the negative is less severe, it appears later towards the second or third day, lasts not so long as after the first injection and even after the 3d or 4th injections, there is only a retarded progress in the recovery.

7. The best time for renewing the injections is when the positive stage is at its height.

8. The formation of lasting or only predominating positive stages allows the complete cicatrization of the abscesses in 20 to 30 days after they are punctured, providing the puncture has been made after the first injection.

9. The doses, which give rise to severe positive stages, vary with the individual susceptibility, the degree of acuteness of the affection.

10. A strong dose produces a severe negative stage sometimes without a positive stage.

11. Too weak a dose gives a slight negative stage and a short and slightly confused positive one.

12. Improvement of the lesions and their rapid cicatrization require constant watching. Interference brings an aggravation of the disease.

13. It is absolutely necessary to open very freely and thoroughly all the abscesses and surrounding tissues as soon as the pus is well formed.

14. Abscesses which have cul-de-sacs, fistulous tracts or those with pale, old granulations do not progress towards rapid cicatrization.

15. Injections must be continued until complete recovery, even when a positive, well marked stage seems to show it.

16. The local treatment, besides the early punctures, must consist of only ordinary antiseptics without washing and needs to be renewed only every 3 or 4 days.

17. In some cases the cryptococci disappear from the pus before the complete repair of the lesions and then there is general sterilization of the organs before the final cicatrization.

After those conclusions, which seem to summarize all the observations of Major Velu, the technic is considered concisely. When one has an animal to treat he should inject 2½ c.c. of vaccine and then wait 7 or 8 days.

Three conditions will then present themselves.

1. A continued aggravation if the injected dose has been too strong. Wait for a few days and then renew it with a smaller.

2. No change has taken place: the dose is too weak—a stronger dose is necessary and must be made immediately.

3. There is marked improvement—the dose is sufficient. It must be renewed without waiting. It may be slightly increased or reduced according to the manifestations of the negative stage produced.

In all the cases the abscesses have, of course, been punctured. The injections should be repeated until complete cicatrization. From 30 to 40 days will be required to reach the final result.

BACTERIOTHERAPY.—The preceding related to epizootic lymphangitis. That form, however, is not the only one of essential importance. There is another, the ulcerous lymphangitis, in which the germ, like that of the other form, is known. The former being due to a bacillus discovered by Preisz and Nocard, from whom it takes its name, while the latter is due to the cryptococcus of Rivolta.

The bacillus of the ulcerous form of lymphangitis has been the subject of many studies and its pathogenic properties and effects on horses, sheep, swine, cattle and goats are well known.

While studying the properties of microbes killed by *alcohol-ether,* Veterinary Major C. Truche also examined the properties of the Preisz-Nocard bacillus, which has such toxic power. In his investigations, Truche was tempted to try bacteriotherapy in the treatment of ulcerous lymphangitis, by using bacilli killed with alcohol-ether. The results obtained, the choice of the vaccine, its

mode of preparation and mode of action were published in the *Annales de l'Institute Pasteur* of May 1917.

The injection of the vaccine is made under the skin of the neck, with a dose of 1 centigram, renewed every eight days, once or twice, according to the severity of the case.

A *slight swelling* appears the day after and subsides rapidly. There is a *weak thermic reaction* (0.5° to 1°). No general reaction.

The ulcerations are soon observed to dry rapidly; the suppuration diminishes. The lymphatic cords disappear after the second injection but recovery is complete only after the third. The legs rapidly assume their proper movements; the skin, its suppleness, the local lesions have disappeared. Relapses, which are very rare, are cut short and arrested by another injection. There are given, in the article of the *Annales,* the details of a small number of cases successfully treated.

It is well understood that the treatment cannot be undertaken, unless the diagnosis has been confirmed and all other forms of lymphangitis but the one due to the Preisz-Nocard bacillus, must be eliminated and not treated by this new addition to bacteriotherapy.

It is said the vaccine can now be obtained from the Institute in any quantity.

Active Antitetanic Vaccination.—At the Société de Chirurgie the following was presented by Professors Valleé and Bazy:

Analyzing the published facts more and more frequently, it is well proved that to protect an organism against tetanus, there is as yet no method possessing constant efficiency. This is due to the fact that we have to oppose to the permanency of the tetanic infection, only the temporary effects of the seral injections. The properties contained in the antitetanic serum may indeed protect quickly from an attack of tetanus, but it is only for a short period and to protect against a long threat of infection, a slow but lasting action of a *vaccine is necessary.* It is that effect that these two investigators have tried to realize in man by the *antitetanic vaccination.*

To prepare this vaccinal liquid, they have used a toxin from Pasteur's Institute having such a power that 1/10000 of a centimeter was sufficient to kill a guinea pig weighing 400 grams, which means that one centimeter can promote the death of 4000 kilograms of living matter. In mixing that toxin with an iodined solution (iodine 1 gram, iodide of potassium 2, distilled water 200)

in the proportion of two-thirds of toxin for one of the solution, there is obtained a complex mixture of a new constitution yet unknown, which is neutral for the organism and yet is able to vaccinate it.

Experience for a long time has demonstrated that such a mixture was well supported by animals. Valleé and Bazy have felt authorized to inject man with 1 centimeter of iodined toxin which had proved itself harmless to guinea pigs.

Seven men, aged between 20 and 32, who had received severe wounds of all kinds and had in addition suffered more or less injuries from frozen feet, and had received several injections of antitetanic serum, were vaccinated by the antitetanic method.

The seral treatment had been entirely discontinued from the time the vaccination was to be applied, and that was only resorted to five days after the last injection of serum.

The injection of the vaccinal liquid was made in the subcutaneous tissue, at three different times, five days apart, in the following manner: 1st. vaccination of 1 cm. of toxin mixture 2/3 and iodined solution 1/3. 2d. vaccination of 2 cms. of the same mixture. 3d. vaccination of 5 cms. of toxin mixed with 2 of iodined solution.

The antitoxic power of the serum of the vaccinated, when examined 10 days after the last vaccinal injection, proved to be between 10 and 100 units, according to the measurements of the Institute. Besides, the immunizing power when tested on rabbits, proved that these animals would, *without any trouble*, resist the injection of 10 drops of vaccine (able to kill 2000 kilograms of living matter).

In other words, counting for men the results obtained with the rabbits, it can be said that the vaccinated wounded could with impunity stand a dose of toxin able to kill 200 kilograms of animal substance, three times the average weight of a middle sized man. In these conditions, it may be said that vaccination has been efficacious.

To summarize the authors say: the value of *preventive serotherapy* is beyond dispute, the *serum* demands no effort from the organism. It brings antibodies already made and to be used immediately; it is the *urgent remedy*, the one that must be used as soon as possible after the traumatism has been inflicted. This action, so rapid as it is, is unfortunately of short duration, as the

antibodies will be eliminated quickly. *Antitetanic vaccination* on the contrary will give, at least it can be hoped, a lasting immunity, but this will only be obtained slowly under the protection of the immediate immunity, already granted by the seral injections and consequently the respective indications for both applications shall be: immediately after the traumatism, give an antitetanic serum injection, renewed, if necessary, at intervals of several days so as to avoid immediate accidents. Then with the immunity thus given, its resistance will be made stronger by vaccination. Let five days, at least, pass after the last seral injection, so as to avoid a portion of the toxin being absorbed by the antitoxins of the serum and become improper to promote the immunizing reaction.

MUD AND ITS BAD EFFECTS.—Relative to the noxious influences he had occasion to observe, during a rainy season at the front at the great defense of Verdun, Veterinary Major Floriot has sent to Societe Centrale an article which to me proved very interesting. It reminded me of similar conditions I had met, many years ago in New York, and which were much more serious as the complications resulting from the effects of mud and frozen slush of the streets had given rise to difficulties which were settled only by court decisions.

In the article of Mr. Floriot the action of the mud is considered as it affected the lower part of the extremities on the soft tissues and hoof.

The first are divided into eczematous lesions, scratches and gangrenous lesions (cutaneous quittor).

The peculiar manifestations are described and also the treatment.

The first two categories, the eczematous and the scratches are referable to those which every practitioner may meet, in, or after, similar exposures.

The third, the gangrenous lesions are more important, as they may involve the various parts of the lower portion of the extremity or even pass up to the region of the cannon, in some cases being very large and accompanied with sloughing of large pieces of skin.

The lesion may assume two aspects. It may be either the moist gangrene, most commonly seen, or the dry gangrene. Recovery in either form depends on the severity and the extent of

the gangrenous sloughing. Sometimes months are required and even, in some cases, a fatal termination can be looked for, if serious complications develop. At times the slaughtering of the animal is necessary.

Among the complications mentioned by Floriot are cartilaginous quittor, toe-crack, necrosis of the tendon of the anterior extensor of the phalanges, loosening and dropping of the hoof, and abscesses.

Considering the etiology of these troubles Floriot states that the mud has three actions: physical, chemical and infecting. It acts physically by its low temperature; sometimes at the freezing point, frost bites, etc.

The chemical action is irritating, being soiled and dirty it promotes infection.

Its third action, the most important, is the part played by the microbes which develop in it.

The article ends by the consideration of the prophylaxis—referring of course to the surroundings of the soil and on the care to be given to the legs of the animal.

URTICA DIOICA.—This is deserving of more than a simple mention of a clinical observation, as it refers to the fact that beyond its injurious effects on the skin and the mucous membranes, it has also a marked toxic action on the whole organism and may affect animals in various degree.

A Reserve Veterinarian, Mr. Morel, noticed that a number of the horses under his charge, had abundant salivation, irregular appetite, and presented on the tongue, palate and internal face of the cheeks numerous small epithelial desquamations.

Inquiring into the nature of the food, which of course was suspected as the cause, it was learned that in the poor hay given to the horses there was a large quantity of the *Urtica dioica,* one of the most irritating of that species of common plants. The food was changed and the troubles of the horses disappeared.

Some days after, however, a 12 year old horse was observed to be dull, prostrated, with the head carried low and the coat staring. He had anorexia, abundant salivation and the saliva was bloody. There was a discharge from both nostrils, which in places were covered with dry scabs. The eyelids were irritated, there was conjunctivitis and tears flowed abundantly down the face. The mouth,

difficult to open, was warm, puffy and dirty. The entire mucous membrane of the tongue, palate and internal face of the cheeks showed numerous elliptic or circular inflammatory spots, some being denuded of their epithelial covering. The sheath was swollen and the urine escaped only in drops. The pulse was quick, there was a loud and arhythmical beating of the heart, the temperature was 39°C. The respiration was accelerated. There was constipation and the feces were dry and coated.

All the manifestations showed a serious condition and yet had a very simple explanation: a meal in which a large quantity of the *Urtica* had been mixed in the hay. Careful treatment, of proper gargles, astringents and antiseptic, with the injection of caffeine brought a perfect recovery in a few days.

The changes on the skin caused by the irritation of the *Urtica* are well known, but there are cases which are accompanied by rather curious symptoms. For instance, a sick horse manifested an incoordination in his movements, had a tendency to turn to the right, his nostrils were dilated, he roared loudly, his body was covered with abundant perspiration, the conjunctivae were much injected, the pupils dilated, the heart jumping, and the pulse was very rapid.

Phlebotomy was performed and, while the blood escaped from the jugular, there appeared on the entire left side of the body a multitude of little pimples, extremely painful and raising the coat of the animal which, before he appeared sick and while in the field where he was turned out, had rolled in a place where large tufts of *Urtica* were growing.

SUMMARY OF CONTENTS OF EXCHANGES AND BIBLIOGRAPHY RECEIVED

*Titles marked "X" will be summarized. Those marked "O" will appear as abstracts.

VETERINARY RECORD. July 21—(O) Occlusion of the conjunctival sacs and palpebral fissure after excision of the eye-ball.

August 4th—(O) Tetanus in dogs.

VETERINARY NEWS. July 21st—Clinical cases. (O) Hernia of the uterus in a cow. (O) Tic convulsif of the facial and accessory nerves of a cow. (O) Convulsion of the accessory nerve in a foal. (X) Humerous side of veterinary practice.

August 11th—Skin diseases of the horse. (O) Melanosis.

VETERINARY JOURNAL. August—Lepinay treatment of mange by sulphurous anhydride. Remarks on sand colics. Poll evil bridle. (O) Serous ab-

scesses on the neck and shoulder from bites. (O) Treatment of grease. (O) Peculiar case of anthrax. (O) Treatment of ulcerative cellulitis with picric acid. (O) Unusual result after the operation for roaring. Tips on camels. (Continued).

VETERINARY REVIEW, Vol. I, No. 3—Notes on the transmission of animal trypanosomiasis in Northern Rhodesia by blood sucking flies other than Glossina.

ANNALES DE L'INSTITUT PASTEUR. July—Surrenal paraganglioma. Antirabic vaccination in 1916.

RECUEIL DE MED. VETER. June.—Treatment of epizootic lymphangitis. New treatment of equine pityriasis. Treatment of tetanus by oxydotherapy.

REVUE GÉNÉRALE DE MEDEC. VETER—(O) Autopsies of some cases of intestinal obstruction.

BULLETIN DE LA SOC. CENTRALE. June—(O) Gastro-duodenal cancer in steer. (O) Sudden death by internal hemorrhage of aneurismal origin in a cow. (O) Notes on aegagropiles in horses.

CLINICA VETERINARIA. July—Contribution to the diagnosis of uterine diseases (Continued). On the specific germ of contagious pustular stomatitis of horses. Experiments on the use of rice as a food of milch cows.

CORNELL VETERINARIAN. July—Infectious diseases of poultry. Examination of the eye. Immunity of suckling pigs to hog cholera. Control of tuberculosis. Chronic indurative nephritis and its relation to ascites in dogs. Case records.

Department of Agriculture of the UNION OF SOUTH AFRICA; a number of bulletins relating to agriculture. A. L.

—Circular No. 9 of the Louisiana State Live Stock Sanitary Board is entitled: Thirty-four Questions and Answers Concerning Ticks, Tick Fever and Tick Eradication, by Doctors Dalrymple and Flower. The questions and answers deal with fundamental conditions and should be of great value to laymen in tick-infested areas.

—Dr. H. E. Johnson, formerly Instructor in Anatomy at the New York State Veterinary College at Ithaca, has resigned to accept the assistant professorship of Anatomy in the Veterinary Department of the Michigan Agricultural College at East Lansing.

—According to a newspaper report, a registered yearling Holstein bull at Marcellus, N. Y. recently ate $139 of a $150 roll, carelessly left in his vicinity. The money was recovered through the medium of a surgical operation. Possibly the bull considered his registry unsatisfactory and determined to become a cash register.

—The Federal meat inspection station at Hutchinson, Kansas, has been placed in charge of Dr. Orville A. Stingley.

STUDIES OF AN OBSCURE CATTLE DISEASE IN WESTERN NEVADA*

WINFRED B. MACK AND EDWIN RECORDS, University of Nevada, Reno, Nevada.

INTRODUCTION. The disease under consideration occurs in the valleys along the eastern base of the Sierra Nevada Mountains and so far as we know has not been reported from other localities. The only reference to it in the literature is a paper by K. F. Meyer** read before the Oakland meeting of this association in 1915. These valleys, which are almost entirely devoted to stock raising, lie at an elevation of 4000 to 6000 feet, varying from arable to swamp, either naturally or as a result of irrigation, surrounded by steep hills ranging from heavy timber to barren.

How long this disease has existed here is uncertain but old settlers describe cases they have observed twenty or more years ago. Until recently whenever a definite diagnosis was attempted by stockmen or practicing veterinarians, it was classed as anthrax, which is not surprising when the clinical similarity of the two conditions is considered.

This had unfortunate results. Many lands were unwarrantably classed as anthrax infected and extensive anthrax vaccination was practiced, with, of course, no resulting control of the trouble, and anthrax vaccination fell into disrepute.

During the period from 1909 to 1914, twelve cases now considered as this disease came to the attention of the senior writer. With one exception, the material was blood or tissues from cattle with a more or less suspicious history, submitted by stockmen and veterinarians with a request for the demonstration or exclusion of anthrax. The one exception was thoroughly examined, both clinically and post mortem, and differed in no major respect from those to be described. In none of these cases was anthrax demonstrable. They received but routine consideration, it seeming sufficient to exclude anthrax and the deaths were considered due to non-specific

*Presented at the fifty-fourth annual meeting of the A. V. M. A., Section on Sanitary Science and Police, Kansas City, Mo., August 20-24, 1917.

**Meyer, Studies to Diagnose a Fatal Disease of Cattle in Mountainous Regions of California. *Jour. A. V. M. A.*, New Series, Vol. 1, No. 5 (Feb. 1916), page 552.

causes. In 1914 abundant material was presented and the demand for diagnosis and assistance in control became insistent.

In January 1915 the junior writer became associated with this work and it has since been conducted jointly, with the assistance of other members of the department staff, practising veterinarians and stock owners.

At that time the possible etiology was carefully considered; anthrax and plant or mineral poisoning having been excluded, this left only hemorrhagic septicemia among the known infections described as occurring in this latitude, and, as we were loath to assume the presence of an entirely new infection, a tentative diagnosis of hemorrhagic septicemia was made. The work to be reviewed consists of an attempt to confirm this diagnosis, though other possibilities have not been lost sight of. The problem was approached along three principal lines, which will be considered in some detail; namely, the clinical picture, the pathology and bacteriology, and immunization and serum therapy.

Clinical Picture. The disease is generally enzoötic, appearing as occasional cases in the herds affected. Nevertheless the aggregate loss is considerable. Occasionally it assumes epizoötic form—in one herd ninety cases occurred among 325 head during a period of four months.

The disease generally appears in May, reaches its height about September, and gradually subsides until January. Occasional scattering cases occur during the balance of the year. Usually the affected animals are on pasture, but a few cases occur in corrals on dry feed. While the malady is undoubtedly infectious, it does not appear directly contagious. Among beef cattle not under close observation many cases are not detected until well advanced. Among dairy herds earlier observations are possible.

In a typical case, appetite, rumination, milk secretion, and generally bowel movements, are suddenly suspended. The animal stands apart from the herd, with its back arched and abdomen tucked up. The coat is dry, lustreless and staring. It is loath to move and may grunt with each step. The facial expression is distressed; the eyes have a characteristic sunken appearance.

Respiration is rapid, of a shallow abdominal type and a grunt often accompanies each inspiration. The muzzle is dry and hot; the visible mucous membranes tinged with yellow. Generally there is a moderate rise of temperature, often to 104.0°F., seldom above

105.8°F. The pulse is increased in frequency but lacks volume and force.

As the disease progresses, the bowels generally become loose, passages are frequent, soft, small in amount, and range from normal to almost pure blood. Urination becomes frequent and copious. There is hemoglobinuria, the color varying from light pink to that of port wine. This continues until the animal suddenly collapses and dies after a brief agonal period.

The natural mortality is high, over 90% in cases marked enough for reasonably certain diagnosis. Those developing hemoglobinuria practically never recover.

The duration of illness after detection ranges from a few hours to two or three days. Many animals are found dead which were never noticed sick during ordinary routine care.

Serological Tests. Blood has been collected from fourteen cases in various stages of the disease. In most cases only one bleeding; in a few cases second bleedings were taken the following day.

Tested against antigens and agglutinating fluids prepared by various methods from strains of *Bact. bovisepticum* isolated during this work, none of these sera have shown any complement binding or agglutinating properties. In view of the acute nature of the infection, this is perhaps not of much significance. (As a matter of fact, these properties are not always developed in the sera of animals hyperimmunized with these strains of *Bact. bovisepticum.*)

Anatomical Changes. No attempt can be made at this time to even touch upon the microscopic pathology. The gross findings in typical cases allowed to die naturally are as follows:

External appearance. Rigor mortis about normal. Perineal region and tail soiled with bloody urine and feces. Fullness along ventral surface of head, neck and sternum.

Subcutem. Rather dry; moderate jaundice. Subcutaneous and muscular tissues show variable amounts of hemorrhage from petechiae to confluent masses. Along the ventral aspect of jaws, neck and sternum a dirty yellow gelatinous exudate fairly firm in consistency; this is also found around the superficial lymph glands, which are enlarged, watery, slightly dark, but not hemorrhagic. Mouth and salivary glands, normal. Larynx and trachea, mucous membrane greyish yellow and showing areas of discrete submucous hemorrhage varying from petechial to one centimeter in diameter.

Thorax. Perhaps a small amount of fluid, varying from clear yellow to turbid, blood stained. Parietal and visceral pleura deeply tinged with yellow; extensive, confluent masses of hemorrhage beneath parietal pleura. Lungs, practically normal; mediastinum infiltrated with yellow gelatinous material; lymph glands enlarged, watery and dark. Thymus, when present, thickly studded with large petechiae.

Heart, considerable fluid in pericardial sac similar to that in the pleural cavity; considerable discrete subepicardial hemorrhage over base and along branches of coronary veins; muscle and valves normal; extensive confluent subendocardial hemorrhage in both ventricles, most pronounced in left.

Diaphragm, extensively hemorrhagic.

Abdomen. Large amount of fluid, pale yellow to greyish, turbid, deeply blood stained; peritoneum yellowish; large areas of subserous hemorrhage irregularly distributed under all portions of the peritoneum and omentum. Fibrinous exudation with adhesion of the abdominal viscera is frequently seen.

First three stomachs, normal; abomasum, mucous membrane congested or even hemorrhagic; first portion of small intestine, mucous membrane hemorrhagic, may even be exfoliated and lumen filled with solid clot of blood; walls thickened by infiltration. A similar condition, less pronounced, may occur at other points along the small and the first portions of the large intestine; cecum, generally more or less hemorrhagic and filled with bloody material from further up the digestive tract; rectum, normal except for bloody contents. Pancreas, normal.

Spleen, generally normal as to color, size and consistency, but showing extensive subcapsular hemorrhage; may be slightly enlarged.

Liver, enlarged, friable, color pale yellow to mahogany; more or less adhesion to diaphragm. Generally one large irregular area, 8 to 25 cm. in diameter located along a branch of the portal vein, having the appearance of an anemic infarct undergoing necrosis and surrounded by a poorly defined zone of congestion. These may be multiple and much smaller. Occasionally the change has progressed to abscess formation. Gall bladder, walls thickened, hemorrhagic and distended with thick dark bile, containing many flocculi.

Kidneys are dark, surrounded by small amount of gelatinous infiltration; surface thickly studded with minute petechiae. On

section the depths of cortex, the medulla and pelvis show little alteration, the latter containing deeply blood stained urine.

Adrenals and ureters, normal.

Bladder, moderate amount of blood stained urine; discrete ramifying submucous hemorrhages.

Genitals, normal in the male; in female the gravid uterus may show subserous and submucous hemorrhage; ovaries and other appendages normal.

Fetuses up to mid-term may show extensive subcutaneous and subserous hemorrhages; if pregnancy is more advanced, they appear normal.

Practically all the abdominal lymph glands are more or less enlarged, watery, dark, and surrounded by serous infiltration.

All the light colored tissues have a distinct yellow tinge. The blood and organs, rich in same, turn a brilliant red after exposure to the air. The entire carcass emits a strong, characteristic, disagreeable odor difficult to describe, even if no post mortem change has taken place.

The above pathological description is based on fifty complete autopsies of naturally occurring cases. The following bacteriological findings cover in addition sixty-three specimens collected by various persons and submitted for examination. They ranged all the way from good material to worthless.

Bacteriological Findings. In autopsies performed immediately after death the circulating blood and all organs except the liver generally reveal nothing in smears or cultures.

Smears from the infarcted area of the liver show fairly uniformly a large rod and a diplococcus. These do not grow on ordinary media under aerobic conditions and we have given them as yet little study. In conversation, K. F. Meyer, who has studied them, stated that he classifies the rod as one of the malignant edema group and the diplococcus as a pneumococcus of Group IV and agrees with us that they are not the cause of the disease in question.

Cultures from the infarcted area of the liver and adjacent tissue, while never showing an increase in the above organisms, generally produce a heavy mixed growth, mostly various types of Gram-negative rods. *Bact. bovisepticum*, even when present, is not numerous enough to attract attention.

Out of the total of 113 more or less complete examinations referred to, five strains of *Bact. bovisepticum* have been isolated.

These all conform absolutely in morphology, pathogenicity and biochemic characteristics to the accepted standard for this organism. Of these, four were obtained by rabbit and guinea-pig inoculation with mixed cultures from the liver, in one instance collaterally from a lymph gland culture; the fifth from a swab taken from jugular blood. In this case the organism was plentiful in the original culture and readily recovered from plates. This case was evidently a true bacteriemia, the only one we have encountered.

An attempt has been made to demonstrate bacteriemia early in the course of the disease. For this purpose 10 mils of venous blood were drawn as early as cases could be reached, immediately placed in 90 mils of neutral plain bouillon and incubated. In some cases this was repeated the following day. Sixteen cases thus examined have failed to yield *Bact. bovisepticum* or anything else of significance.

Cattle Inoculations. Twenty-one cattle have been inoculated in an attempt to reproduce the disease experimentally, two of them with defibrinated blood from a typical acute case, one with a suspension of tissues obtained at autopsy, the others with cultures of *Bact. bovisepticum*. The limits of this paper do not permit their detailed discussion. Briefly summarized the results are as follows:

Two yearling heifers received 30 mils each of blood obtained by slaughtering a sick animal, one subcutaneously, the other intravenously. No symptoms resulted from the inoculations.

Another yearling was inoculated with a suspension of mixed liver and lymphatic glands obtained at autopsy. It became desperately sick and in thirty-six hours death appeared imminent. Its temperature rose during twenty-two hours to 106.8°F, moderated during the next two days, fluctuated up to 104.1°F during seventeen days and the animal recovered. It then succumbed in fifteen hours to inoculation with a culture of *Bact. bovisepticum* isolated from the animal from which the material first used was taken.

Every strain of *Bact. bovisepticum* isolated was inoculated into cattle.

The first produced moderate but not serious illness, rise of temperature on the second day to 105.2°F and extensive abscess formation. The second caused slight illness, a rise of temperature to 104.8°F on the ninth day, followed by recovery.

The third strain killed the yearling above referred to in fifteen hours, another in twenty hours. Its passage through cattle in series was undertaken. After one bovine passage it killed in forty-eight hours. Two calves, inoculated with it after two passages, were very seriously ill and unable to arise for three days, gradually improving during two weeks. They survived but never regained good health. Seven months after inoculation they were stunted and unthrifty, practically worthless. Two others which received the same virus died, one in forty-six hours, the other in ninety hours. A yearling, given the virus after its third bovine passage, was very sick for three days, after which it slowly improved. It survived but remained stunted, hide bound, lame, and carried its back arched. This animal became altogether worthless, a mere physical wreck, ruined by the inoculation.

Another yearling inoculated with the same virus was moderately sick for two or three days, then recovered completely. Thus, of nine cattle inoculated with this strain subcutaneously and intravenously, five died promptly with well developed hemorrhages throughout, three lived but were valueless, and one recovered. Apparently the virus became attenuated during its passage in series through cattle.

Two yearlings were given the virus orally. They were moderately sick for a day or two with elevation of temperature. The subsequent oral administration of large doses produced no particular disturbance.

With the fourth strain of *Bact. bovisepticum*, four cattle were inoculated. A yearling was moderately sick for a few days following inoculation and completely recovered. Another became seriously sick immediately after inoculation. The knees, hocks and ankles swelled tremendously, the animal emaciated rapidly and gradually lost strength and condition, until sixty-one days later it was unable to arise, and was killed and autopsied. The infection had localized on the joints and tendon sheaths of the legs and had caused extensive destruction of cartilage and bone in the pelvic articulations. Another animal followed much the same, although a more rapid course. It was killed in a dying condition after thirty-eight days. Abundant hemorrhages were found, with lesions similar to the above in the pelvis and extremities. The fourth animal exhibited the same symptoms, though less severe. It lost flesh and strength, was dejected and lame, but recovered

gradually and at the end of four months appears to have practically recovered.

With the fifth strain a yearling was inoculated. It developed an extensive swelling at the site of inoculation which gradually subsided, developing a small abscess which, following incision, healed promptly. In a month it had regained normal condition.

Thus, while in some cases acute hemorrhagic septicemia of the experimental type with extensive hemorrhages was produced, nothing comparable to the natural infection has resulted from inoculation with either tissues or cultures. The absence of the odor referred to was particularly striking.

IMMUNIZATION. Soon after *Bact. bovisepticum* had been isolated from some of these cases, it was decided to undertake vaccination experiments both as a means of control and for confirmation of diagnosis.

For this purpose double vaccination has been practised, Vaccine No. 1 consisting of a 48 hour bouillon culture of as many strains of *Bact. bovisepticum* as were available, mixed and killed by the addition of 1% phenol, and used in a dose of 5 mils.

This was followed in ten to twelve days by Vaccine No. 2, which was a 48 hour bouillon culture of a strain of *Bact. bovisepticum* which had lost its virulence for bovines but not for rabbits, used alive and without any attenuation in doses of 2 mils.

By this method 644 cattle were vaccinated in 1915 and 2599 in 1916, a total of 3243 head. Following this treatment 27, or 0.83% died, presumably from this disease, though a few cases were doubtful. In 1917, to August 1, 2003 have been vaccinated and while no attempt has been made to tabulate the results, they appear equally good.

Our own observations and the opinion of owners agree that the procedure appears to have lessened the number of cases and that those which do occur are milder in type and more apt to recover without serum treatment.

SERUM TREATMENT. The therapeutic serum has been prepared by hyperimmunizing horses with several strains of *Bact. bovisepticum*. This is administered in 200 mil doses intravenously and repeated the next day if marked improvement is not shown.

Thirty-three cases in various stages of the disease from early to advanced, have received this treatment. Twenty-two have recovered and eleven died. Of the twenty-two recoveries, fourteen

had been vaccinated; of the eleven dying, seven had been vaccinated. The percentage of recoveries is the same in each group, viz. 66 2/3%. The eleven which died all showed marked hemoglobinuria. Of those recovering there is specific mention of hemoglobinuria in the records of seven cases. This may have been present but not recorded in some of the earlier cases.

CONCLUSIONS. 1. Whatever the nature of this infection, it appears to be taken up from the intestine and carried to the liver by the portal vein where it establishes itself, produces severe local damage, and later overwhelms the animal, either by extension into the blood stream or by the liberation of a soluble toxin.

2. The original hypothesis that this is an atypical form of hemorrhagic septicemia has not been proven. The bacteriological and serological findings are rather against this theory. The clinical observations, anatomical changes and the results of immunization and serum therapy seem to favor it.

DISCUSSION

DR. SIMMS: I think we have had this same trouble in Oregon. We lost a good many animals in that state. We have done very little laboratory work with the disease. We made a bacteriological examination of only three animals, one sheep and two head of cattle, and in two of these three we isolated a microorganism that we thought was hemorrhagic septicemia. I can not state how many animals have been vaccinated, but I know there have been many thousand of both sheep and cattle. The work has been done principally through the State Veterinarian's office, and the vaccine has been prepared by the Bacteriological Department rather than the Veterinary Department, so I can not give the figures. We have attempted to use check animals in herds, wherever possible. Of course most owners object so strenuously to that that we have not been able to check in a great many instances. I recall one case where we left fifteen checks, and vaccinated thirty. Out of the thirty vaccinated we have had one death. Of the fifteen checks we had ten deaths. This was in a section of the state where this trouble had occurred for the last twenty or thirty years, where the cattle owners have learned from experience that they cannot raise their young stock very well, and they buy mature cows and bring them in rather than attempt to carry the calves through the yearling or two year old stages, these ages seeming to be the ones at which animals are most susceptible. The vaccine that we have had prepared, has been prepared from four or five different strains of the organism. I believe one or two were isolated in Pennsylvania, one, I think, was obtained from the Bureau of Animal Industry.

We have been very well satisfied at least with the reports from vaccinated herds. Whether the vaccine is giving satisfaction in all instances we do not attempt to say.

DR. HARING: Dr. K. F. Meyer, in cooperation with the State Veterinarian of California, has been working with a disease in Siskiyou County and elsewhere in the Sierra Nevada Mountains, which is probably the same as that studied by Drs. Mack and Records. This trouble is usually called "bloody murrain" by the farmers. I have had an opportunity to autopsy a few cattle in a county bordering on the Pacific Ocean, in which I found lesions exactly similar to the excellent description given by Drs. Mack and Records. In the paper which was read reference was made to the lack of literature and I would like to call attention to a paper given by Dr. John Iverson, Deputy State Veterinarian in California, at the meeting of the California State Veterinary Medical Association in Los Angeles in 1916, published in the proceedings of that meeting, in which he described this disease as it occurs in Sierra Valley, California, and with more professional courage than has been shown by Drs. Mack or Records he gave it the name of hemorrhagic septicemia. The question as to whether this is the right name or not cannot be decided without further investigation, but it seems to me he has as good a chance of being right as some of the observers in the middle western states and other parts of the country who have described outbreaks of a similar disease and reached the conclusion that it was hemorrhagic septicemia. Dr. Records describes five cases in which *Bact. bovisepticus* was isolated out of one hundred and thirteen autopsies, from which cultures or animal inoculations were made. I believe Dr. Meyer secured one culture out of fourteen attempts. Dr. Simms' record as just described seems more successful. Veterinarians from the University of California have made several attempts to secure cultures from autopsies, but have always failed. I would like to ask Dr. Simms what they call the disease in Oregon.

I recently saw a letter from a practitioner in Nevada in which the disease was described as "red water." It would seem to me very unfortunate if the term "red water" should come into use throughout the southwestern United States as a name for the disease described by Drs. Mack and Records. This disease apparently has no similarity to the red water of cattle which has been described by observers in the State of Washington and British Columbia.

DR. ELIASON: During the last two years we have had diseases of this kind breaking out at various times in the state of Wisconsin. We have not made any attempts to isolate any disease, but in a general way, if you can conduct post-mortems enough, you will find hemorrhagic septicemia. You may not find typical lesions in all cases, in fact in a great many of them there is nothing differentiating, but the treatment has been very successful with vaccine preparations. These preparations have been prepared both by the

bureau and by the biological houses. There can be no doubt that this disease is hemorrhagic septicemia.

DR. FITCH: There was a disease in the northern part of New York state which caused a considerable loss of cattle during 1914. Numerous specimens were sent to the laboratory for diagnosis. No positive diagnosis could be made. The symptoms shown by these animals were very similar, practically analogous to those described by Dr. Records. In 1915 the same disease broke out, and I went to the northern part of the state (New York) to investigate, and to make a long story short, it was shown that this disease was hemorrhagic septicemia. I simply inject this into the discussion to show the extreme difficulty in making a bacteriological diagnosis of hemorrhagic septicemia in many cases. I do not wish to be understood as saying that the disease Dr. Records has described is hemorrhagic septicemia.

DR. SIMMS: In Oregon the veterinarian calles it hemorrhagic septicemia. The stock owners I believe have no common name for it; a good many say a new disease but they do not call it red water. We have red water as described in Washington and British Columbia, and a good many cattle men are familiar with that, and they know that hemorrhagic septicemia is an entirely different disease.

DR. MOHLER: I wish to suggest that in future experiments Dr. Mack and Dr. Records take the spleen of some of the suspected animals and inoculate rabbits.

I know it is very difficult to isolate the *Bacterium bovisepticus* from field cases and it requires a good deal of effort at times to recover the organism even from animals injected experimentally with hemorrhagic septicemia. For that reason I would suggest to these investigators that they take the spleen of an animal dying of this obscure disease and inoculate rabbits, depending on these experimental rabbits to establish a definite diagnosis. Not infrequently large flasks of bouillon inoculated with cubes of the infected organs from such rabbits will produce abundant growths of the causative agent. Personally I am of the opinion that the disease described is hemorrhagic septicemia.

DR. CAHILL: At a previous meeting of this association I made certain inquiries regarding hemorrhagic septicemia in swine with the object of ascertaining whether or not any person had experienced this disease in outbreaks where hog cholera could be absolutely excluded.

On account of the large proportion of swine in Massachusetts which have been immunized against hog cholera by the simultaneous method, we have been able during the last two years to find outbreaks of hemorrhagic septicemia in which hog cholera can be absolutely eliminated, and to prove to our satisfaction that hemor-

rhagic septicemia caused by *B. suisepticus* does exist as an independent disease exclusive of hog cholera.

An interesting point brought out by this work has been to show that the commonly accepted test to differentiate between hemorrhagic septicemia and hog cholera cannot be depended upon. For some time it has been the custom to assist in making a differential diagnosis between the two diseases to inject a certain number of young pigs with a small amount of defibrinated blood from the suspected animal, and then in turn to inject a similar number with blood which had been passed through a Berkfeld filter. If all the pigs so injected die showing the proper lesions, the trouble has been diagnosed as hog cholera, whereas if only the ones which receive the whole blood die, the trouble has been diagnosed as hemorrhagic septicemia. Our work along this line has demonstrated the fact that swine injected with living cultures of *B. suisepticus* will not develop hemorrhagic septicemia, and indeed that the large majority of animals injected with blood from a pig suffering with hemorrhagic septicemia will not develop the disease even after *B. suisepticus* has been demonstrated in the blood. We are therefore forced to the conclusion that the above described test cannot be depended upon.

Following the lead of Hardenbergh's method we have been using living cultures of *B. suisepticus* in controlling hemorrhagic septicemia after the disease has been diagnosed, with most excellent results.

I would like to ask for the experience of others in this respect, particularly as to whether or not they have been able to cause the animals so inoculated to succumb to the disease.

DR. H. PRESTON HOSKINS: A number of the speakers have referred to the difficulty of isolating the hemorrhagic septicemia organism in quite a large percentage of cases, and it has been customary, at times, for diagnostic purposes, to make smears from the blood films, or from the tissues, and the presence of bipolar staining organisms would be taken as indicative of the hemorrhagic septicemia infection. In this connection I might say that during the past year I have had occasion to make comparisons of a large number of strains of supposedly hemorrhagic septicemia organisms, in a study of this disease, and two of these strains, from widely separated parts of the country, have turned out to be pure cultures of the colon bacillus. Under certain conditions the colon bacillus looks very much like the hemorrhagic septicemia organism, especially in smears made fresh from animal tissues. Further than that, of course, there should be absolutely no excuse for anybody confusing the two organisms, for by carrying the cultures further, there are other points of difference to be easily differentiated.

DR. RECORDS: The questions of Drs. Simms, Eliason and Fitch can well be answered together.

In working with this group of organisms, both in cattle and other animals, there seems to be a great variation in the ease of bacteriological diagnosis. We had at our department a slide made directly from the tissues. I think it was the pleural exudate of a sheep, which was sent to us by Dr. Lytle of Oregon and probably represents some of the work which Dr. Simms has mentioned. That slide was very rich in typical, bipolar organisms. We have never found anything that could be compared to that. Occasionally we found an odd individual or two of the bipolar organisms in a smear. This goes to show the variation in the infection in cattle in different localities. In Nevada we have a great deal of fowl cholera, which is merely the chicken and turkey infection with this same group of organisms. In the birds we get a frank reaction, the tissues teeming with the organisms.

Answering Dr. Haring's question, the name that the stock owners have arrived at of their own volition generally is "bloody murrain." We do hear the term "red water" occasionally, but those in closest contact with the University have taken our tentative opinion and learned to pronounce the word "hemorrhagic septicemia."

In reference to Dr. Mohler's suggestion of direct animal inoculation, that is one of the points which the brevity of this paper compelled us to ignore, but we have dóne a series of several hundred small animal inoculations directly from the tissues, generally using a pretty full series of tissues from each case, including the spleen when in good condition. We have never produced a positive infection in such rabbits from any of these tissues. The recoveries we have made, as I mentioned, have been achieved by planting small plugs of tissue cut from around the infarcted area of the liver and blown into bouillon, rabbits being inoculated with these cultures after incubation. By this method the animal receives a much larger number of organisms than were present in the original material. Direct animal inoculations have always been a failure with us.

—Dr. George W. Famous has been placed in charge of the meat inspection station at Allentown, Pa., and Dr. Frank G. Miller has charge of meat inspection at Gardiner, Mont.

—Dr. Robert Thuman of the B. A. I., formerly of Chicago, Ill., has been transferred to Cincinnati, Ohio.

—Dr. J. M. Baxter has removed from Gary, Ind. to 2159 W. Adams St., Chicago, Ill.

Dr. Owen Howells, formerly of Muscatine, Ia., has removed to Kansas City, Kans.

ADVANTAGES OF TESTING PURE BRED HERDS*

S. H. WARD, St. Paul, Minn

Some three or four years ago the subject of accredited tuberculosis free herds was suggested. Since that time considerable discussion has resulted, but little or nothing has been done. For the past six years a statute of Minnesota has required the seller of pure bred cattle to give to purchasers a certificate of health issued by the Live Stock Sanitary Board showing the animal to have been tuberculin tested within a year and free from tuberculosis.

North Dakota followed by enacting a similar law, and it was hoped other states would fall into line until the movement became general. It appears, however, the problem of obtaining similar requirements by other states has been more difficult of solution, and a policy of inducement rather than compulsion has been recommended, as being easier of accomplishment.

Unfortunately for the breeding industry, inducement does not meet with the reception expected unless adequate compensation is given; hence, until such time as the breeders are encouraged by state assistance in the way of reimbursement for any losses which may follow the tuberculin test, little or no effort will be made by them to clean their herds nor will any steps be taken to push the movement of an accredited herd list.

The large breeders, who are selling stock for interstate movement, must realize by this time that the success of their business and the disposal of their surplus stock depends greatly upon satisfied customers. The cost of testing individual animals for interstate shipment, the delay in shipping and the uncertainty of an animal standing up to the test, must be a source of annoyance, worry and expense to the breeders who are selling a number of animals each month. Further, a movement is on foot by the states most interested in keeping out animals from diseased herds, to black list herds from which importations of diseased cattle have been received within a certain time. This information is imparted to those in charge of sanitary control work and intending buyers are warned not to purchase from such herds. Unfortunately, we are not always able to get in touch with intending buyers, but more

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and more of our breeders are consulting us regarding the conditions of foreign herds.

During the past six years, in which the law requiring sellers to give to purchasers of pure bred cattle a certificate of health issued by the Minnesota Live Stock Sanitary Board, we have had occasion to test every known pure bred herd in the State. Many of these have been tested every six months, others every year, and again others only at intervals of two years.

As Minnesota permits an appraisal of $150 for pure bred cattle, providing the pedigree is filed with appraisal, we have found that fully 55 per cent. of diseased animals paid for, have at some time been imported, many times accompanied by a certificate of tuberculin test.

During the past four years we have noted the name and addresses of breeders who have shipped pure bred animals into Minnesota which, under our test were found diseased. It may surprise you to be informed that over two hundred breeders in the states to the south and west of Minnesota, clear to the Atlantic, have within this time furnished Minnesota with diseased animals. The names of many prominent breeders, in these states, may be mentioned as having tuberculosis present in their herds. Our work of locating diseased herds in other states by uncovering imported reactors is a costly way of obtaining such information. We should be willing to pay for information by which clean herds could be located, but evidently the good cannot be separated from the bad and we must look upon all pure bred herds in other states as being diseased, unless certified by the proper officials as being clean.

In our work of the past year, ending July 31, we have tested 271 herds comprising 9472 cattle of which 226 reacted. Of these 139 were bred in other states and imported into Minnesota.

Reactors were found in 49 herds comprising 2193 cattle, leaving 222 clean herds of 7279 head of cattle.

It seems to me there should not be much difficulty in obtaining legislation that would protect a buyer and the Minnesota law is an example of the protection that should be afforded a purchaser.

CHAPTER 392—S. F. NO. 535.

AN ACT prohibiting the sale of pure bred cattle unless accompanied by a certificate of health.

Be it enacted by the Legislature of the State of Minnesota:

Section 1. All persons selling pure bred cattle or cattle represented to be pure blooded, for breeding purposes, shall before delivery, make a report to the state live stock sanitary board on blanks furnished by the board on appli-

cation, stating the number of cattle sold, their age and sex and to whom sold, and before delivery thereof such cattle shall be tested with tuberculin and a certificate of health be given by said live stock sanitary board or some person duly authorized by the board, to the seller and purchaser; provided, that no such certificate shall be required in case the cattle so sold shall have been tested within one year under the direction of the live stock sanitary board and the laws of this state, and a certificate of health granted by said board within that time; provided, further, that no certificate shall be required for animals under one year of age.

Sec. 2. Any person who shall sell or dispose of any pure bred cow or bull for breeding purposes without furnishing a certificate as stated in section 1 of this act, shall be guilty of a misdemeanor.

Sec. 3. This act shall take effect and be in force from and after January 1, 1910.

If such a law cannot be obtained, then the farmers should be educated to buy only upon a guarantee of health. The veterinarian's client calls upon him to examine horses for soundness. Why cannot the client be further enlightened to employ a veterinarian to examine a cow for soundness?

If recovery and damages could be obtained from breeders of animals found tuberculous within a reasonable time after sale, the solution would be easy. Unfortunately, it is seldom that an individual would attempt to recover through the courts because of the great expense involved, especially when parties to the contract are residents of different states. What then can be done to protect the innocent buyer?

To some, this question may have no particular interest, but to others, who are striving for a better condition and the protection of the herds over which they have supervision, the question is a most important one.

I am inclined to think our Minnesota breeders will in the near future ask for legislation prohibiting the importation of pure bred animals unless they are certified as coming from accredited tuberculosis free herds. Possibly three states are in a position to ask, through their breeders, for such legislation. These states may be named: North Dakota, Montana, and Minnesota,—states which have more advanced tuberculosis legislation than any others. The effect of such legislation will be to restrict the sale of breeding animals to a few herds.

While many breeders would simply refuse to advertise or look for business in the three states mentioned, they would redouble their efforts to ship to states that offer an open door, which would mean the further spread of tuberculosis and so many more centers of infection to control, if at any time control measures may be instituted.

While the great difficulty confronting some states is the great prevalence of the disease, I firmly believe if state authorities will approach a few breeders and induce them to place their herds under state supervision, pointing out to them that the listing of such herds with the authorities of sister states will mean a cheap and highly successful way of advertising and permit the unrestricted and free movement of their cattle, success would follow and sooner or later others would fall into line.

The time is rapidly approaching when a nation wide attempt will be made to eradicate tuberculosis and of necessity the beginning must be made with the pure bred herds, because to them must be credited the spread of the disease by reason of their transfer.

The breeder, at first, will consider an injustice is being done him and will argue the same rule should apply to all cattle, but grades do not enter into the foundation of the cattle industry and rarely change hands except for slaughter, hence the argument has little value. The breeder should be shown that upon him depends the prevention of new centers of infection, which will ultimately increase the amount of tuberculosis in the section to which diseased animals are shipped. A very conservative estimate of the prevalence of the disease in pure bred herds may be set at 15 per cent. Assuming the breeders of a single state, such as any one of the central group, sell, in the course of a year, 2,000 head of breeding cattle and that even 15 per cent. are diseased and only one per cent. find their way into clean herds, we have 30 new centers of infection created annually. Such new centers must ultimately cause a deterioration of live stock values in the community. The advantages which will follow the eradication of the disease can be pointed out and consist of:

1. The consciousness and pride in the knowledge that the herd is healthy.

2. The listing of the herd whereby, in a way, it is advertised, not only in its own state but in others, as being free from tuberculosis.

3. The immediate shipment of purchased animals without any restrictions or expense of individual tests.

4. It gives an added value to the stock.

5. It is practically a guarantee by the state or federal government of the healthfulness of the animal.

6. Protects innocent buyers from purchasing diseased animals.

7. Stimulates the breeding industry, because of the demand for clean stock.

8. Eradication of the disease in pure bred herds represents a very large share in the ultimate control and eradication of the disease.

9. Permits exhibits at state fairs, many of which require a certificate of test.

10. Prevents new centers of infection which would otherwise occur if animals were diseased.

11. When imported animals react, we have a line on the condition of the herd from which the animal originates and can warn our breeders of the probable existence of the disease in that particular herd.

VOLVULUS, INTUSSUSCEPTION AND HERNIA THROUGH THE OMENTUM IN THE HORSE AND NEW BORN FOAL*

J. F. DeVine, Goshen, N. Y.

It is possible that some of the older practitioners assembled here are wondering why I have chosen this subject unless I have something new to present in the way of treatment or relief for these very serious conditions, since, knowing that in the various works and articles in which the subject is touched on, let the treatment be what it may, it is rather given in a perfunctory manner and I personally question if any of the treatments or handlings prescribed, where there is true volvulus or hernia of the omentum, have ever relieved a single case in the adult horse. I would concede that there probably have been cases of what might be termed semi-torsion of the larger bowel that have been relieved by the antics of the suffering animal and by manual manipulation, special rolling of the animal, etc. The unfortunate part of it is that I do not feel capable of even suggesting treatment of any merit other than the aid in diagnosis and mitigation of the acute suffering that these conditions occasion.

I now come to my excuse for presenting this subject to you, and

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it is possible with the exception of the younger men it may hold but little interest for you.

The *diagnosis* of these conditions is the phase of the subject in which I am most interested. All authors that I have read, even such capable men as contributed to the recent work on "Colics and their treatment," pass by rather lightly the diagnosis of these troubles. One particularly able writer, who contributed to the work mentioned, states he has "never been able to find these conditions except at the post-mortem examination."

My great interest in acute gastro-intestinal troubles of the horse, accompanied as they are with more or less severe pain, dates back to the time before and during my student days. My interest in the horse, sick or well, I think was surely pre-natal and whenever I heard of a case of so-called colic in the neighborhood, even when a boy, it had the same fascination for me that a fire or dance had for some others. While I, of course, knew nothing of the physiology or pathology, there was one thing quite plain and that was the poor animal's suffering. This, in most cases, was almost unbearable and the cases terminating in death often, to the lay mind, seemed as if they died purely from the shock of pain, which of course is literally true in some cases.

I then and there decided that, if I could ever become a veterinarian, I would do my best to lessen this awful suffering in our noble animal.

Of course it is now common knowledge that many of these acute digestive troubles are errors in feeding and can be positively avoided. When I entered the veterinary college and became legitimately associated with the practice of veterinary medicine, serving as assistant to other practitioners, I established a custom which is still carried out at my office, and that is, that when I received a call and found it to be the so-called colic I never left such a case until the animal had recovered or died. I further established a practice which I have since continued and that is that if possible, a post-mortem is always made on every animal that dies under our care, if there is a question of diagnosis. In fact with the exception of outbreaks of contagious diseases where animals die in numbers from some particular scourge, I think I can safely say we post 90% of all cases that die. This is made rather convenient in my locality where rendering factories are accessible or the carcass is easily disposed of on the farm.

The fact that I was privileged to watch these cases for others and afterwards for myself with the resultant post-mortem, where the case terminated fatally, accentuated my interest.

With the advent of the stomach tube and the knowledge that this instrument, the trocar, stimulants, enemas and mild cathartics, particularly salines frequently repeated, were, in 95% of the cases far superior to narcotics and anodynes, which mask the symptoms rather than relieve the cause, gave me hope of the fulfillment of my early wishes.

My next desire was to differentiate, if possible, the positively fatal cases from those that had the chance of living with good intelligent care and medication. By careful observation of the pulse and temperature, manual examination per rectum and close scrutiny of every movement of the suffering animal, I began to feel that I could determine with reasonable accuracy the cases that were purely intestinal rather than gastric; also that where the client would give us an early opportunity to treat such cases, all could be saved excepting those of a serious organic nature and further, that I could diagnose and prognose this type of case with a reasonable certainty.

I have no admiration, in fact no respect, for the "four flusher" or the positive, offhand diagnostician, but a great respect for a capable veterinarian who by careful observation can make a rather positive diagnosis that a condition not amenable to treatment exists, and can sort of prepare his client for the probable fatal result of a case and does so honestly, gentlemanly and courteously, explaining to him that the case presents certain characteristics which, to him, would indicate that it would terminate fatally and that if it be the owner's desire he would be pleased to have consultation. After he has done this and death follows he can show to those concerned by post-mortem the proof of his diagnosis. There is but little danger of the loss of such a case causing the loss of a client.

Before reciting the symptoms on which I base my diagnosis I would like to state publicly that, whatever my interest on this subject may have been, I doubt if I would have ever been so persistent and patient in my early life in watching and posting these cases had it not been for the encouragement given me by the late Roscoe R. Bell whose memory as a preceptor I shall always cherish with the greatest respect. I had the great privilege of acting as

his assistant in the year of 1899 and during that time I ventured the diagnosis of volvulus of the small intestine or hernia through the omentum in three cases and intussusception in two others. His unfeigned delight at each of the post-mortems and his good counsel would have been inspiring to one even less enthusiastic than I.

I kept careful record until I had posted 29 cases of twist in the small intestines, three of the larger bowel, three of invagination of the small intestine through the omentum in the adult horse and eight cases of invagination of the small intestine within itself and one into the cecum of the newborn colt. Of late, work of this character has been entrusted to assistants as I have not felt I could spare the time. We of course continue to have these forms of colic the same as do all practitioners and I occasionally talk with my assistants about such cases. All information they have gathered seems to agree with the records I have accumulated up to within a few years ago, which I will here give you without further explanation excepting to say that I was prompted to prepare this short paper due to the fact that I recently gave personal attention to a valuable colt that one of my assistants was treating at one of our stock farms. The owner being a particular friend and very desirous of saving the colt if possible, asked me to take charge of the case, so I decided to lay other work aside and do what I could. The colt died from a severe invagination on the third day and thinking that that part of the bowel might be of interest to some one here I brought it with me.

To get at the point, let us imagine ourselves in the presence of a horse suffering with volvulus, due either to a twist of the bowel upon itself or a hernia of a piece of the intestine through the omentum, or a case of invagination. The symptoms are practically the same excepting in the two former, conditions are more intensified and death ensues earlier than in the latter. The symptoms presented upon our arrival will depend greatly upon how long the animal has been suffering. Say the attendant tells us that the animal was taken some thirty minutes previously with sudden and severe colicy pains, occasional straining accompanied with small passages of fecal matter, lying down, jumping up, and when down endeavoring to roll on the back. If we watch the animal a few minutes we may get this information ourselves providing we are not satisfied with the history given us by those in charge. The

things that will arouse our suspicions if present are:—the straining, the small amount of feces that is passed and particularly the desire to get against the siding or corner of the stall where he can remain lying for a time on his back.

It is true than in acute spasmodic colic particularly of an exhaustive or nervous nature such as we see in the trotter, hunter, thoroughbred or show horse after an excitement, workout or race, or in case of calculus we do get these very sharp pains and confusing symptoms that last a short time, therefore it is quite natural that we may administer any favorite colic remedy, chloral, cannabis, morphine, etc. and we may get what appears to be pretty fair results from the first dose. The animal becomes quieter or possibly real quiet for a few minutes; in the case of a large dose of chloral being given the ease may last from 15 minutes to half an hour from the time it begins to take effect but this will soon give way to uneasiness again. If we attempt further quieting medication we will find that this time the action of our drug is not so well marked. The animal continues to grow worse and all symptoms are aggravated. He will lie on his back for a few minutes, jump up, walk hurriedly around in the stall a few times, step back in the corner, swing his head up and down three or four times, breathe short, fast, and heavy with a semi-grunt at each expiration, point with his nose rather low in the flank holding it there perhaps some minutes at a time, and then resume his march of pain. He now begins to perspire; this is apt to increase until his entire body is so wet that the perspiration drips off him. After a time his body becomes cold and clammy. He may or may not bloat slightly. In case gas does accumulate tapping causes easiness for a time. He stretches at times throughout the attack as do animals that are suffering from other obstructions of the bowels; that is assuming a position like a trained hackney does when standing to be admired. These symptoms are observable anywhere from one to four hours from the beginning of the attack providing of course that one of the conditions are present which we are discussing, at the beginning of the attack.

We are all aware that many a mild case of abdominal pain is later complicated by torsion of the intestines due to the horse's violent rolling. Such cases would naturally not have the sypmtoms of torsion or volvulus until we had this condition to deal with.

After we have observed some or most of these symptoms the

treatment is only pretentious; oil, enemas, anodynes and antispasmodics are indicated and it is well to give them even though we think the case fatal, it will aid to retain the good graces of our client.

The animal's pulse now becomes very hard and fast; the temperature begins to rise from two to five degrees; we also note that there is less and less inclination to lie down, possibly due to a complicating peritonitis, but he walks instead blindly around and around in the stall knocking his head in each corner until it is painfully abraded. The abdomen is tucked up, the countenance drawn and respiration is short and painful. We also note about this time a characteristic which is quite constant and that is an occasional neigh at familiar sounds, such as footsteps, opening or closing a door, or the moving of his mate. Should you now through a humane act remove him to a roomy box stall or paddock he will trot occasionally, stopping now and then for a few seconds, swaying as if he would fall, suddenly starting off again until finally from extreme pain and exhaustion he is compelled to fall; however, it is not uncommon to see animals regain their feet and continue their insane perambulation after many falls, each one appearing to be the last. Neither is it uncommon to see them have periods of apparent relief just before death in case they do not die of nervous shock before the bowel has become completely strangulated, cold, and on the verge of gangrene.

To see all this has consumed several hours but we can now make our diagnosis which we have been predicting all along and can feel pretty safe in telling our client that death will ensue in from twelve to twenty-four hours. Death always occurs earlier in volvulus than in intussusception and in the case of the former the duration will depend largely on the amount of intestine involved; the greater the surface strangulated the sooner death ensues.

The points in diagnosis therefore I wish to emphasize are:—

1st. The early acute pain. 2nd. The great desire to lie on the back. 3rd. Frequent passage of small amounts of feces. 4th. The violent straining that we ofttimes see in impaction of the colon without this condition being present which may be determined by rectal examination. 5th. The distressed condition and lack of pronounced gastric symptoms. 6th. The apparent inertness of any drug given after the effect of the first dose or two wears away. 7th. The constancy of the acute pain being fully as acute as in

intestinal calculus, the latter, however, having periods of intermission of pain. 8th. The hard pulse, the distressed look and the high temperature of a case of peritonitis with the lack of cautiousness in lying down rather a careless or violent throwing of himself. 9th. Backing up in the corner and swaying the head up and down. 10th. Occasional neighing as he nears death. 11th. The growing tendency as the case advances to continue his walking and the peculiar position assumed while walking, sort of doubling up so to speak, with the appearance that the hind parts are going faster than the front. This can be likened to the position a man assumes when he is in acute abdominal pain and attempts to walk, and last the almost pathognomonic symptom when associated with those recited and that is the holding of the nose against the abdomen.

What I have to say relative to these conditions in the newborn foal must surely be directed at the younger man to avoid being accused of egotism and that is, that it is my judgment that intussusception is not diagnosed in the young foal with nearly the frequency that it exists, since it is rather a frequent occurrence in the baby colt. The least bit of colicky pain in these little fellows always gives me considerable concern and where the case continues for any length of time and I fail to find a scrotal hernia I immediately suspect intussusception.

The best drug that I know of in these cases is plenty of hot water forced high in the bowel per rectum. It is still better if a liberal supply of linseed or olive oil has been added. I cannot see how cathartics other than oil as a lubricant can be of any value whatever but rather must aggravate the condition since in my experience all invagination or telescoping has been antero-posterior, that is the excessive peristalsis has invaginated a part posterior to it.

We may have rather extensive invagination and the symptom presented be comparatively mild and the colt live for two or three days as was the case in the specimen I here show you, but let the symptoms be ever so mild we have the characteristic desire for the little fellow to lay on his back.

There are two things therefore I would suggest to the young practitioner. First, medicate your small colts with great caution; never giving over a dram or so of any drug or even oil at a time, when they are suffering with pain because if you do and you give enough of it you are apt to have the privilege of holding a post-mortem and find you have drenched into the lungs rather than the stomach.

The other is in abdominal pain of the colt if you have eliminated other trouble suspect invagination and treat your colt by giving liberal enemas with a good bit of force having the colt's hind parts held up so he is standing on his head so to speak and insert your stomach tube or soft rubber catheter per rectum just as far as you possibly can get it, but of course with great caution dilating the bowel with liberal quantities of water forcibly pumped ahead of your tube. I have seen cases where the pain was instantly stopped by this process without any other treatment whatever, indicating that the mechanical dilation had relieved what was probably a very slight invagination. I have also seen sloughs passed after a day or two where colts had recovered from what appeared to be invagination and where no doubt invagination had been sufficient to cause pain and death of the part, but not extensive enough to cause permanent obstruction.

As to treatment in the adult horse I have nothing to suggest. My method is as soon as I feel reasonably certain of my diagnosis to obtain permission to have the animal destroyed.

The large opening in the abdomen that is usually required to locate and disengage the strangulated bowel in the dead horse has thoroughly discouraged me against any attempt at surgical interference to relieve this condition in the living one.

REQUIREMENTS FOR INTER-STATE SHIPMENT OF STALLIONS*

J. F. GILLESPIE, Tuscola, Ill.

The stallion registration laws of the different states (with few exceptions) are uniform, in the manner of registration, issuing of the licenses and advertising, and posting of copies of the licenses. The standard for breeding, as generally accepted (by the various states) are the societies or associations, certified to, or recognized by, the Department of Agriculture of the United States of America.

In the twenty-six states, now with stallion laws, Illinois, Kansas, Minnesota, Missouri, New Hampshire, and New York, require that stallions only be licensed, (the writer was unable to obtain a copy of the Vermont law, which is omitted in this paper). The laws in nineteen states require that jacks shall be licensed in the same manner as stallions.

*Presented at the mid-summer meeting of the Illinois State Veterinary Medical Association, East St. Louis, Ill.

The states of Iowa, Montana, and North Dakota, require that a certificate of soundness accompany the shipment and a copy forwarded to the Stallion Registry Board of the respective state, such certificates shall be executed by recognized state or federal veterinary officers.

Blank forms may be obtained by communicating with the respective Stallion Registry Boards.

The problem that now confronts us in this work is, that we must know the laws in the various states, that we may advise parties wishing to make such shipments, whether or not the animal is sound, within the meaning of the law, in the state for which such shipments are destined. If, however, the animal is found to be unsound, at the destination, the owner has violated the law in that state, at a heavy personal expense, by and with our professional advice, (through ignorance or irregularity), while at the same time the animal may be sound, within the laws of a number of other states, this is the situation, in cases where there are no requirements for importation or the disqualifying diseases are not specified in the laws. In some instances no certificate of soundness is required to obtain a license and none required on importation; in other instances the laws specify that no stallion or jack shall be imported into the state, affected with any one of the disqualifying diseases specified in the law, yet no provisions are made for accepting certificates of soundness issued in another state, for importation. We have no guide that we may know the standard for soundness in any one of the states that come under this head. We will now take for consideration the disqualifications specified in the laws of the various states, we will find that the variation in the standards for soundness is almost as great as the number of states that have the stallion laws. Let us ask that the Live Stock Sanitary Boards of the various states, take this matter up and give us if possible a uniform standard for soundness, or regulations of the different states and assurance that a certificate of soundness will be accepted in the state for which such shipment is destined. It has been only a few years since the requirements for inter-state shipment of all kinds of live stock was in the same condition that the inter-state shipments of stallions is in today. We have a uniform health certificate acceptable through the proper channel, in every state in the union. It is just as embarrassing to advise a client that we do not know and that we have no uniform regulation

for the shipment of stallions into another state and whether or not the stallions can be licensed after he gets him there, as it was a few years ago when we had no uniform system for inspection of other livestock for shipment into another state. The impression thus left with the client is, that if he had consulted a progressive up to date veterinarian he would have obtained the desired information and would not have had the shipment delayed some ten days or two weeks seeking information.

To take each law as a whole would consume much valuable time that might be used in discussing more important subjects. We will take for consideration the points in the laws (of each of the separate states) that are of the most interest to the veterinarian and the inspection for inter-state shipment of stallions and jacks.

California. Disqualifications for stallions and jacks: Periodic ophthalmia (moon blindness), cataract, laryngeal hemiplegia (roaring or whistling), pulmonary emphysema (heaves, broken wind), chorea. (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, side bone, navicular disease, osteoporosis, curb, when accompanied with faulty conformation of hock, or any communicable disease.

Complaints and Decisions: On complaint, three veterinarians are selected to decide upon the merits of the case, one is selected by the state, one by the owner and in case they do not agree, they may choose a third; the decision of this board is final.

Colorado. Disqualifications for stallions or jacks: Roaring, ring bone, spavin, specific opthalmia (moon blindness), or any form of venereal disease. Renewals each year must be accompanied by certificate of soundness.

Complaints and Decisions: All complaints are referred to the state veterinarian whose duty it is to examine such animal and report to the State Live Stock Commission.

The Commission in charge of this work is empowered to use stallion funds, each year, for the purpose of offering special premiums at any fairs in the state, to be competed for, by horses, mules, or colts bred and raised within the state and exhibited at such fairs. The Commission may use such funds for premiums in any way that in their judgment will encourage improvement of breeding of horses and mules in Colorado, that will give the best results.

Idaho. Disqualifications for stallions or jacks: Hemiplegia, roaring or whistling, chorea, stringhalt, bone spavin, bog spavin,

thorough pin, enlarged side bones, urethral gleet, ophthalmia, cribbing and curb when accompanied with a curby hock, or any marked, faulty or weak conformation, which he is liable to transmit.

Complaints and Decisions: Re-examination only on complaint, veterinarian selected by commission decides the case.

INDIANA. Disqualifications for stallion or jack: Recurrent ophthalmia (moon blindness), cataract, glaucoma, amaurosis, laryngeal hemiplegia, (roaring or whistling), pulmonary emphysema (heaves), chorea (crampiness, stringhalt, glanders, maladie du coit, urethral gleet, mange, bog spavin, bone spavin, curb, when associated with curby conformation of hocks, ring bone, side bone, navicular disease.

Complaints and Decisions: Certificate of soundness is required every two years up to the age of ten years, if at that age the animal is sound within the meaning of the law, no re-examination is required, unless complaint under oath by two free holders in the county and one licensed veterinarian, is presented to the board; re-examination by veterinarian chosen by the stallion board, is final.

IOWA. Disqualifications for stallion or jack: Glanders, farcy, maladie du coit, (dourine), coital exanthema, urethral gleet, mange, melanosis, blindness, cataract, periodic ophthalmia (moon blindness).

Stallion or jack possessing the following named unsoundnesses may be licensed, by advertising in large type or writing, specifying the particular unsoundness, amaurosis, laryngeal hemiplegia (roaring or whistling), pulmonary emphysema (heaves, broken wind), bog spavin, bone spavin, ring bone, side bone, navicular disease, curb, with curby formation of the hock, chorea (St. Vitus dance, crampiness, shivering, stringhalt).

If animal proves to transmit any of the above mentioned unsoundnesses, he may be disqualified for same.

Certificate of soundness is required each year, issued by a graduate veterinarian of a reputable college.

Complaints and Decisions: On complaint the animal is re-examined, the owner choosing a veterinarian, the board choosing one and the two choose the third. If the complaint is sustained the owner bears the expense, if not, the expense falls upon the state.

All importations shall be accompanied with certificate of soundness under oath, by veterinarian and approved by state veterinarian. Any or all diseases or unsoundnesses named in this article

will disqualify stallion or jack from importation. Special blank forms are furnished on request, by Secretary, Board of Agriculture, of the State of Iowa.

ILLINOIS. Disqualifications for stallions only: Periodic ophthalmia (moon blindness), bone spavin, ring bone, bog spavin, curb, when accompanied with curby formation of hock, or any contagious or infectious disease.

Complaints and Decisions: Re-examination required only on complaint, inspector, veterinarian selected by the board.

KANSAS. Disqualifications for stallions only: It shall be optional with the owner whether or not the stallion shall be examined for soundness, but no stallion shall be advertised as sound, directly or indirectly, until a certificate of soundness has been issued by the State Live Stock Registry Board. The certificate is valid only to and including the 30th day of December, in the year in which it was issued.

No provisions were made for disqualifying importations.

MINNESOTA. Disqualifications for stallions only: Cataract, amaurosis, laryngeal hemiplegia (roaring or whistling), chorea (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, side bone, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis, and curb when accompanied with curby hock.

Stallions shall be examined for soundness every four years until ten years old or over, inspections made by reputable veterinarians.

No provision for re-examinations on complaint.

MISSOURI. Stallions only: no disqualifications are specified in the law, it is optional with the owner, whether or not the stallion shall be examined for soundness. All such examinations are conducted by a veterinarian authorized by the Stallion Board. Stallions can be advertised as sound only during the life of such certificate, which is December 31st, each year; the standard for soundness is determined by said board.

No provision for disqualifying imported stallions into the state.

MONTANA. Disqualifications for stallion and jack: Cataract, amaurosis, laryngeal hemiplegia, (roaring or whistling), chorea, (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, side bone, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis, and curb when accompanied by curby deformity.

Certificate of soundness shall accompany all importations, executed by a recognized federal, or state veterinary officer, and a copy of the same to be forwarded to the Stallion Board of Montana; blank forms may be had on application to the Stallion Registration Board, Bozeman, Montana.

No stallion or jack, which is neither pure bred nor grade, shall be imported into the state of Montana.

The word grade is defined as one in which either sire or dam is of pure breeding and registered as such but not both.

The Stallion Board appoints veterinarians to conduct the examinations and a fee of $10.00 is charged by the board for the enrollment and examination, all stallions and jacks shall be examined every four years until ten years old, thereafter none required.

NEBRASKA. Disqualifications for stallion or jack: No stallion or jack shall come into the state of Nebraska, affected with urethral gleet, melanosis, periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring), cataract, amaurosis (glass eye), chorea, St. Vitus dance, stringhalt, bone spavin, bog spavin, ring bone, side bone, curb, with curby formation of hock, or is seriously defective in conformation, or vicious disposition.

All stallions and jacks shall be examined, between the ages of two and three years, and again between the ages of five and six years, by veterinarians appointed by the State Veterinarian, and disqualified if found affected with melanosis, periodic ophthalmia, or contagious and infectious disease.

NEW HAMPSHIRE. The New Hampshire law requires that the certificates of breeding for stallions only, (so far as known) be recorded with the Secretary of Agriculture of that state. No certificate of soundness is required.

Stallions are admitted into the state of New Hampshire, under the same regulations as other horses.

NEW JERSEY. Disqualifications for stallions or jacks: Cataract, amaurosis (glass eye), periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring or whistling), pulmonary emphysema (heaves, broken wind), chorea (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, side bone, ring bone, navicular disease, bog spavin, curb with curby formation of the hock, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis, osteoporosis, canker of the foot, laminitis.

Examination as to soundness shall be made each year, (until

the animal is ten years old or over, thereafter exempt, if sound), by one veterinarian and one practical horseman, appointed by the Stallion Registry Board. They shall advertise the place or places in the county three times where owners may assemble stallions and jacks for examination.

There may be such a committee appointed to act in each county. They shall receive ten dollars per diem and expenses.

NEW MEXICO. No stallion or jack shall come into the state of New Mexico, that is affected with urethral gleet, melanosis, periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring), cataract, amaurosis (glass eye), chorea (St. Vitus dance), stringhalt, bone spavin, bog spavin, ring bone, side bone, curb, with curby formation of hock, or is seriously defective in conformation, or vicious disposition.

Stallions and jacks shall be examined each year; at the age of eight years may be exempt, if the animal has three preceding certificates of soundness: all examinations are conducted by veterinarians appointed by the Stallion Registry Board.

Colts under eighteen months old are not classified as stallions.

NEW YORK. Disqualifications: stallions only: Recurrent ophthalmia (moon blindness), cataract, amaurosis (glass eye), laryngeal hemiplegia (roaring or whistling), pulmonary emphysema (heaves, broken wind), stringhalt, bone spavin, side bone, navicular disease, curb, when associated with curby formation of hocks.

Examinations are required each year (by veterinarians, approved by the Commissioner of Agriculture), until stallion is fifteen years old.

NORTH DAKOTA. Every person, firm or company importing any stallion or jack into the State of North Dakota for breeding purposes shall first secure a certificate from a recognized state or federal veterinarian, certifying that said animal is free from any or all of the diseases or unsoundnesses referred to in section 2765. This certificate should be made in duplicate form, one to accompany the shipment and a copy forwarded to the Secretary of the Stallion Registration Board at least five days previous to importation of such stallion or jack.

Disqualifications of stallion or jack: Cataract, amaurosis, laryngeal hemiplegia (roaring or whistling), stringhalt, glanders, side bone, farcy, maladie du coit, urethral gleet, mange, bone spavin, ring bone, and curb when accompanied by curby hock.

Complaints and Decisions: The owner if not satisfied with decision or inspector may file a complaint with the board, accompanied with a deposit of twenty-five dollars and a sworn statement of a qualified graduate veterinarian stating that he has examined the animal in question and found said animal free from unsoundnesses or disease specified in the law.

Three experts are appointed, (one by the owner, one by the board and the two appoint the third) to pass upon the merits of the case. If the decision is reversed the Stallion Board licenses the animal and bears the expense, if sustained the owner forfeits sufficient amount of his deposit to cover the expense.

All examinations are made by graduate veterinarians (of a recognized college) in the employ of the Stallion Registry Board.

Stallions and jacks shall be examined every three years, after the first examination. If ten years old or over are thereafter exempt.

Blank forms for issuing certificates of soundness for importation may be had on application to the Stallion Registration Board, Agricultural College, North Dakota.

OKLAHOMA. Stallion or jack: The law in Oklahoma is very liberal in its provisions, leaving optional with the owner the registration and license, but making provision for the legal and easy collection of service fees for those availing themselves of the privilege of registration and license.

No stallion or jack shall be advertised as sound, directly or indirectly, until a certificate of soundness is issued by the Live Stock Registry Board, then only during the life of such certificate, which expires December 31st, of the year in which it was issued.

Disqualifications for certificate of soundness: Moon blindness (periodic ophthalmia), cataract, roaring or whistling, heaves, or broken wind, St. Vitus dance, stringhalt, bone spavin, ring bone, side bone, navicular disease, thorough pin, bog spavin, curb with curby formation of hocks, glanders, farcy, urethral gleet, mange, and retention of one or both testicles (cryptorchid).

No disqualifications are specified for importation.

OREGON. Disqualifications of stallion or jack: Cataract, amaurosis, periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring or whistling), chorea (stringhalt, St. Vitus dance), bone spavin, bog spavin, ring bone, side bone, and curb when accompanied with curby formation of the hocks, or diseased or so badly deformed as to be unfit for breeding purposes.

The license certificate is valid for a period of three years. When the stallion or jack is ten years old or more the certificate is valid for the remainder of the life of the animal.

All examinations are made by graduate veterinarians in the employ of the Stallion Registry Board, except when a protest is filed by the owner, that the decision is unjust, then three veterinarians are appointed to pass upon the merits of the case, one by the owner, one by the board, the two appoint the third; if two of the veterinarians acting sustain the decision, the expense shall be paid by the owner, if reversed the expense shall be paid by the board.

PENNSYLVANIA. No disqualifications are specified in the Pennsylvania law for registration of stallions and jacks, leaving it optional with the board. Veterinarians issuing certificates of soundness in Pennsylvania shall state the particular unsoundness if any in the certificate.

All stallions and jacks over the age of two years coming into the state shall be inspected by a representative of the Live Stock Sanitary Board, before a license can be issued.

SOUTH DAKOTA. Disqualifications of stallion or jack: Specific ophthalmia (including moon blindness. etc.), laryngeal hemiplegia (roaring or whistling), bone spavin, ring bone, glanders, farcy, maladie du coit, urethral gleet, mange, bog spavin, curb when accompanied by faulty conformation.

All stallions and jacks shall be examined every two years, (by a licensed veterinarian) until the age of seven years; if sound at that age no farther examination is required, except on complaint.

Complaints are taken care of by the Live Stock Sanitary Board.

UTAH. Disqualifications of stallion or jack: Cataract, amaurosis, periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring or whistling), pulmonary emphysema, chorea (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, enlarged side bone, navicular disease, bog spavin, curby formation of hock, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis, or any marked, faulty, or weak conformation which is likely to be transmitted.

Veterinarians or inspectors appointed by the Horse Commissioners of the state of Utah, conduct the examinations. Complaints are taken care of by the Commission.

VERMONT. The author was unable to obtain a copy of the Vermont stallion law.

WASHINGTON. Disqualifications of stallion or jack: Bone spavin, ring bone, side bone, navicular disease, bog spavin, curb, with curby formation of hock, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis.

Complaints and Decisions: When complaint is made to the department of animal husbandry that a stallion or jack is unsound, and, on investigation, an examination is deemed necessary, such examination shall be made by the State Veterinarian, or his deputy; but the owner shall have the right to select some registered veterinarian to act with the State Veterinarian, and in case these two fail to agree they shall appoint a third registered veterinarian to act as referee, and his decision shall be final.

Any person, firm or corporation bringing any stallion or jack into the state shall within sixty days thereafter procure a license certificate provided for in section 1.

WEST VIRGINIA. Disqualifications of stallion or jack: Cataract, amaurosis (glass eye), periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring or whistling), pulmonary emphysema (heaves, broken wind), chorea (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, side bone, navicular disease (disease of coffin joint), bog spavin, curb with curby formation of hock, glanders, farcy, maladie du coit, urethral gleet, mange and melanosis.

Certificate of soundness is required every two years until the age of ten years, thereafter exempt.

Complaints and Decisions: Complaint filed signed by three responsible parties. Two veterinarians are selected to pass upon the merits of the case, one by the owner, one deputized by the Commissioners of Agriculture, if they fail to agree the two shall select the third veterinarian; their decision is final.

The law of West Virginia requires that any person keeping any bull, ram or boar, for public service or sale, exchange or barter, that he represents a pure breeding, shall cause the same to be registered in a recognized herd book and secure a license certificate provided for in the laws of that state.

WISCONSIN. Disqualifications of stallions or jacks: Cataract, amaurosis (glass eye), periodic ophthalmia (moon blindness), laryngeal hemiplegia (roaring or whistling), pulmonary emphy-

sema (heaves, broken wind), chorea (St. Vitus dance, crampiness, shivering, stringhalt), bone spavin, ring bone, side bone, navicular disease, bog spavin, curb with curby formation of hock, glanders, farcy, maladie du coit, urethral gleet, mange, melanosis.

Examinations are made by legally qualified veterinarians.

Complaints and Decisions: Complaints shall be signed by three responsible parties. Two graduate veterinarians are selected to pass upon the merits of the case, in case the two do not agree they shall select the third to decide the case; the decision is final.

WYOMING. Disqualifications of stallion or jack: Certificate of soundness signed by a qualified veterinarian that the stallion or jack is free from any hereditary, infectious, contagious or transmissible disease, or serious defects in general conformation, and that the veterinarian is not interested in the buying and selling of horses and mules.

NOTES IN REGARD TO BOTS, *GASTROPHILUS SPP.*

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In connection with some anthelmintic investigations, the writer has taken occasion recently to test the efficacy of carbon bisulphide in expelling bots from horses. Carbon bisulphide has been used for this purpose for some years and has been generally satisfactory, so far as clinical observation shows anything; it removes bots, often in large numbers. This treatment was advocated by perroncito and Bosso in 1894, and subsequently found efficacious by Wessel, Taar, Bugarli, Cognesi, Hanke, Kröning, Nieder and others. It was recommended in the Weekly News Letter of September 10, 1913, issued by the U. S. Department of Agriculture. I have been told that tests of the treatment were conducted by Dr. Cooper Curtice of the Bureau of Animal Industry and its efficiacy confirmed. Carbon bisulphide is at present marketed in this country under a proprietary name for use against bots and worms. Against worms it has a certain anthelmintic value, not as yet well ascertained.

The writer's experience has indicated that it is not easy to determine the efficacy of an anthelmintic by the number of worms passed after treatment, since a few worms passed may represent

all those present and a large number may represent a small proportion of those present. Consequently it has seemed worth while to apply the acid test for such treatments, i. e. a treatment followed by post-mortem examination, to the carbon bisulphide method, which method may be regarded as anthelmintic in its broad aspects and insecticidal in its intent.

Horse No. 3 was first given anthelmintic treatment, consisting of 12 mils of oil of chenopodium, followed at once by 800 mils of linseed oil. The examination of the manure for the next 4 days showed no bots. In these experiments the manure was very carefully examined, being picked apart, a small handful at a time, by myself or my assistant, Mr. B. A. Drake. It was a very long and tedious operation, but such as to warrant us in the belief that no bots present could be overlooked. On the fourth day this horse, which had not been fed since the previous evening, was given 20 mils of carbon bisulphide in a capsule at 9:45 A. M. This was repeated at 11:15 A. M. At 1:45 P. M. the horse was given 800 mils of linseed oil. No bots were found in the manure the next day. The manure for the second and third day was examined the third day and 1 bot was found. The fourth day there were 5 bots, and the fifth day there were four bots. During the next three days no more bots were passed, so on the eighth day the horse was given the carbon bisulphide more nearly in accordance with the method published by the U. S. Department of Agriculture, the animal receiving 3 doses of 3 drams (about 12 mils) each at hour intervals, the treatment being given after fasting the horse from the previous evening. However, the preliminary purgation there recommended was not undertaken. An examination of the manure for the next 16 days did not disclose the presence of a single bot.

On the sixteenth day after the second treatment, the horse was killed. A very thorough examination of the digestive tract, including an examination of all of its contents by methods as careful as those used in examining the manure showed an entire absence of bots of any sort. The first treatment, resulting in the passage of 10 bots in 5 days, was therefore 100 per cent effective, and would presumably have been that effective if given as recommended by the Department of Agriculture or in 4, 10- to 12- gram doses at hour intervals as recommended by some writers. It is usually more convenient to give 1 or 2 doses than 3 or 4, all other things being equal, but owing to a certain element of danger in such drugs

as carbon bisulphide, small doses given more frequently are safer, since treatment can be stopped if untoward symptoms develop early. An examination of the bots passed showed that all three of the common species, *Gastrophilus intestinalis* (*G. equi*), *G. nasalis* and *G. hemorrhoidalis*, were represented, the treatment being effective against all of them. The stomach of the horse showed some hemorrhagic and necrotic areas and a small ulcer in the cardiac portion. Whether the carbon bisulphide was responsible to any extent for the pathological conditions noted is a question that I would not care to pass on without further data. Various veterinarians have reported bad effects in horses from the administration of carbon bisulphide and Hutyra and Marek state that some animals may even succumb to it.

Horse No. 4 was given 20 mils of carbon bisulphide, followed in 1½ hours by 800 mils of linseed oil. Five days later, this horse was given 12 mils of oil of chenopodium followed at once by 800 mils of castor oil. Nine days after the chenopodium treatment, the carbon bisulphide treatment was repeated, giving 3 doses of 3 drams each. Ten days after the last treatment the animal was killed. No bots were passed during the entire treatment and none were found post-mortem. This experiment, therefore, throws no light on the question of efficacy. The digestive tract was normal, showing that the treatment does not necessarily involve serious lesions of the digestive tract.

Aside from carbon bisulphide, turpentine is practically the only remedy used to remove bots. Inasmuch as chloroform is a very penetrating and lethal agent, it might be supposed that it would kill bots. In practice it does not appear to have been found of value in this connection, and experimental test supports the idea that it is not useful in expelling bots. Horse No. 2 was given 16 mils of oil of chenopodium followed immediately by 800 mils of linseed oil and 100 mils of castor oil. No bots were passed subsequent to this treatment, and 15 days later the horse was given 20 mils of chloroform, followed 15 minutes later by 750 mils of linseed oil. No bots were passed during the next six days, and the horse was killed on the sixth day. Post-mortem examination disclosed the presence of 7 bots in the stomach, 35 in the duodenum, and 1 in the cecum. The chloroform was therefore entirely ineffective against bots. The stomach, with the exception of the areas where the bots attached, was normal; the intestines showed local congested and inflamed areas.

We may therefore summarize the data obtained from the above experiments in treatment as follows: Carbon bisulphide is highly effective against all American species of bots (100 per cent in this experiment); chloroform, contrary to what one might suppose, is quite ineffective against bots, in the dose tested and as given; and oil of chenopodium, as one might suppose, is of no value against these highly resistant larvae. As noted later, chloroform also failed to remove bots from dogs.

Possession of the bots from Horse No. 2 suggested an experiment along the lines of incidental myiasis. Within 5 hours after they were collected, six specimens of *Gastrophilus intestinalis* (*G. equi*) and 6 of *G. nasalis* were put in No. 00 gelatine capsules, 1 to a capsule, and 3 specimens of each species fed to each of 2 dogs, Nos. 93 and 94. Bots, 1, 2, and 3 in number, have been found in the stomach of the dog at least three times, aside from artificial infestations, their occurrence there being attributed to the eating of the bot-infested stomach of the horse. Bots have been reported once from the stomach of the hyena, apparently infested in the same way, and a similar explanation may be invoked in the case of *Gastrophilus inermis* reported as occurring firmly attached in the crop of a crow by Skrjabin. Railliet reported feeding the larvae of *G. intestinalis* (*G. equi*) to 5 dogs. One had no bots at the end of 8 days; another had 1 bot attached in the stomach and 1 free in the ileum in 20 hours; a third had 5 bots attached in the stomach, 2 attached in the rectum and 2 free in the rectum at the end of 7 days; a fourth had 2 larvae attached to the stomach at the end of 15 days; while a fifth had no bots a month after being fed 6 of them.

In our experiment the feces from the 2 dogs were carefully examined each day, being comminuted and washed through the set of screens which the writer has described in previous publications. Dog No. 93 passed 4 bots on the third day after he ingested them; on the twenty-fourth day he passed another bot and some *Dipylidium*. On the twenty-fourth day the dog was given 10 minims of oil of chenopodium, 20 minims of chloroform and 30 mils of castor oil, followed 2 hours later by 60 mils of castor oil. The following day the dog passed 1 whipworm and the next day 3 whipworms. On the day preceding the anthelmintic treatment the dog had passed 1 ascarid. On post-mortem examination, 35 days after the ingestion of the bots and 11 days after the anthelmintic

treatment, 1 live bot, *Gastrophilus intestinalis,* was found in the tip of the cecum, apparently not attached. There were also 7 whipworms in the cecum and 2 hookworms in the small intestine.

Dog No. 94 passed 2 bots on the eighth day after ingesting them, and passed another on the ninth day, the last one being accompanied by the passage of 3 whipworms. On the twenty-fourth day the dog was given 15 minims of oil of chenopodium, 30 minims of chloroform and 60 mils of castor oil, followed 2 hours later by 30 mils of castor oil. On post-mortem examination, 35 days after the ingestion of the bots and 11 days after the anthelmintic treatment, 1 live bot, *G. intestinalis,* was found attached in the fundus of the stomach, and another live specimen of the same species was found attached to the large intestine about 6 inches from the anus. There were 125 whipworms present in the cecum. The sixth bot was unaccounted for; it had probably been passed alive and had crawled out of the pan forming the floor of the dog's cage.

From the foregoing it appears that of 6 specimens of *Gastrophilus intestinalis* fed to 2 dogs, 3 specimens succeeded in establishing themselves for the 35 day period which terminated in the death of the dogs. They were established in such diverse locations as the stomach, the cecum and the lower part of the small intestine. The one in the stomach was undoubtedly well established; the others may represent larvae which had formerly attached in the stomach but were unable to maintain that position and were holding at different points on their way out. There is no obvious reason why bots of species other than *G. intestinalis* should not be found in the stomach of the dog; at the same time this experiment suggests that there may be some reason for this. None of the specimens of *G. nasalis* which were fed to these dogs maintained themselves up to the time of post-mortem examination. They were evidently able to maintain themselves as much as 8 days, and might have stayed as much as 24 days (the species of the bots as passed was unfortunately not ascertained), but they failed to establish themselves as did *G. intestinalis.* The reason for this is not at all evident. They were apparently no more mature, which would have been a reason for passing out. *G. intestinalis* usually lives in the esophageal portion of the stomach of the horse, whereas *G. nasalis* and *G. hemorrhoidalis* usually live in the pyloric region or in the duodenum, but I am unable to formulate a reason from this as to why *G. intestinalis* should survive in the stomach and intestine of the dog and the others fail to do so.

The above experiments were performed in March. In September, Dog No. 129 was given 6 full-grown specimens of *G. intestinalis* and 6 young specimens of *G. hemorrhoidalis,* in capsules. He presently vomited the 6 *G. intestinalis* and 3 *G. hemorrhoidalis.* These were given again, and presently the dog vomited 3 *G. intestinalis* and 2 *G. hemorrhoidalis,* which were again given to him. The day following, the dog had passed 2 *G. intestinalis*; the third day, he passed a third bot of this species; the fourth day, a fourth, and the thirteenth day, a fifth bot of this species. The twenty-ninth day after giving the bots to the dog, the animal was killed, and no bots were found on post-mortem. It is likely that the bots not recovered were vomited during the first 24 hours and being still lively had escaped from the feces and the cage. At any rate, young specimens of *G. hemorrhoidalis* failed to establish themselves in the dog. They certainly failed to remain a month and apparently failed to establish themselves at all. The short time the *G. intestinalis* remained, 13 days or less, may be correlated with the season, the bots being fully-developed, and perhaps incapable of overwintering in a host.

It is interesting to note that the passage of one bot from Dog No. 93 was preceded the day before by the passage of 1 ascarid, was accompanied by the passage of *Dipylidium,* and was followed the next day by the passage of 1 whipworm and the second day by the passage of 3 whipworms; and that the passage of 2 bots from Dog 94 was followed the next day by the passage of 3 whipworms, accompanied by another bot. In the case of Dog No. 93, the dog was given anthelmintic treatment the day the bot passed, and this might account for the subsequent passage of whipworms, but the passage of the ascarid and *Dipylidium* in this case and of the whipworms in the case of the other dog suggest that the bots acted as mechanical anthelmintics, entangling *Dipylidium* and whipworms in their spiny covering and perhaps driving the ascarid along as a result of contact with these spines. It is possible that some cause operated to expel the worms and bots together, but such spontaneous expulsion of such dissimilar parasites from 2 dogs is a less likely explanation than that the bots acted as mechanical anthelmintics. The frying of tow or oakum in grease and feeding it to a dog as a mechanical anthelmintic is an old device; even cowhage and similar substances have been recommended as mechanical anthelmintics, though probably less effective than fried oakum.

One might even include among mechanical anthelmintics a tapeworm trap, recorded in the U. S. Patent Office, which is intended to be baited for tapeworm and swallowed by the patient.

In a recent article, Roubaud (1917: Compt, rend Acad. d. Sci., v. 164 (11), 12 Mar, pp. 453-456) has made some very interesting observations in regard to the life history of the bot-fly, *Gastrophilus intestinalis* (*G. equi*). He notes that some authors think that the larvae escape from the egg and gain the mouth and nose; most writers think that they get into the mouth as a result of the horse licking the hairs and are then swallowed, some writers explaining the licking as following a slight pruritus due to the action of these larvae on the skin; reasoning from the presence of *Gastrophilus* larvae in the skin of man, Cholodkovsky believes that the larvae leave the egg and penetrate the skin of the horse, causing an itching which leads the horse to scrape these parasitic burrows with his teeth, thereby rooting out and ingesting the larvae; reasoning from the same starting point, Portchinski believes that only some of the larvae, individuals sacrificed for the preservation of the species, penetrate the skin of the horse, the irritation resulting in the horse licking off other larvae which are not imbedded in the skin and swallowing them.

Roubaud has evidence pointing to a different life history. According to his observations, the eggs of the bot-fly do not open spontaneously and the primary larvae may remain in the egg for several weeks; Guyot has observed cases where they lived thus over 3 months. Roubaud finds that a brisk shock on the anterior pole of the egg will cause the operculum to open, the larvae promptly escaping from the shell; moisture, such as would be furnished by licking, is not necessary. This conforms, moreover, to the well-known fact that horses lick themselves with the tongue very little; when a horse has an itching or irritated area, he rubs it with the nose or bites it. The larvae probably escape when a horse does this for any cause whatever. The most interesting feature of Roubaud's observation, however, is the fact, demonstrated by bot larvae on guinea-pigs, that when the larva escapes from the egg and is brought in contact with the buccal mucosa, it promptly burrows into the mucosa and lies parallel to its surface in a relatively superficial position. When brought in contact with the skin of the horse, whether it is wet or dry, these larvae do not burrow and do die very rapidly on the dry skin. He thinks bot larvae in the

human skin enter through the lips or eyelids or through a lesion in the skin, and notes that eggs of *G. hemorrhoidalis* have been found on the eye brows and lashes in such cases of cutaneous myiasis. Larvae under the buccal mucosa disappear in 2 or 3 days, but one was seen travelling along the side of the tongue for 9 days, during which time it grew to three times its first dimensions. The larvae probably undergo the molt to the second stage at this time and leave the buccal epithelium for the gastric cavity.

During recent years we have seen our ideas regarding the life history of the ox warble, *Hypoderma,* upset; Roubaud's findings apparently necessitate a certain revision of our life history for the bot flies.

SUMMARY. Carbon bisulphide, in experimental test followed by post-mortem examination, is as highly effective against bots as clinical findings indicate.

Neither chloroform nor oil of chenopodium are of any value in removing bots, so far as our experiments show; this bears out the clinical findings for chloroform and conforms to the probabilities for oil of chenopodium.

Gastrophilus intestinalis (*G. equi*) is capable of incidental myiasis in dogs, when well developed larvae from the stomach of the horse are fed to them, but *G. nasalis* and *G. hemorrhoidalis* seem to have only a limited capacity for adaptation to conditions in the dog.

Roubaud's investigations indicate that the bot larva escapes from the egg when the horse bites or rubs his skin with his mouth and burrows into the buccal mucosa before proceeding to the stomach.

—Dr. Morris Zurkow has removed from Wamego to Topeka, Kansas.

—Dr. W. J. Brown has been transferred from Chicago, Ill. to Mason City, Ia.

—Dr. C. C. Mix, formerly of Battle Creek, Mich., has accepted the chair of surgery in the Grand Rapids Veterinary College.

—Dr. M. E. Dennington has removed from Baldwinsville to Cortland, N. Y.

—Dr. A. S. Almeida, formerly of Dixon has located at Los Banos, Calif.

CLINICAL AND CASE REPORTS

REPORT ON THE USE OF DAKIN'S SOLUTION

H. E. KINGMAN, Fort Collins, Colo.

In the preparation of Dakin's solution we have used Dufresne's technique. This has been carefully described by Dr. H. S. Eakins in the *Journal of the American Veterinary Medical Association*, Vol. LI. N.S. Vol. IV, No. 2, pp. 221-229, May 1917. We have found that a stone churn with a glass top, such as is used for butter making, makes an ideal container. The solution will retain its original strength in this container for at least two weeks. If it is drawn from the churn and placed in well corked jugs it will lose its chlorine content quite rapidly the first week but not so rapidly thereafter. A jug of such a solution that tested .46 on July 14th, tested .36 on August 18th. It is claimed that in order to be effective the solution must test between .48 and .50, but we have apparently obtained good results from solutions testing .36%.

In reporting upon its use at this time we do not claim to have reached definite conclusions but we do feel that the veterinary profession in general is interested and that the thirty or more cases upon which we have used it represent the common ones found in veterinary practice. The progress of our cases at this time would indicate that in reasonably fresh wounds such as wire cuts and other accidental wounds serious infection can be controlled and the time of healing very materially shortened. In surgical wounds such as fistulas of the poll and withers, infection is also controlled and the time consumed in healing is materially shortened, but it seems to us that its principal use in these cases is confined to the first few days following the operation. We have not experienced the serious wound infections accompanied by swelling, heat and pain, along with a general systemic disturbance that sometimes occurs in these cases after an operation. However, we have long believed that fistulas should not be irrigated, and are still of the same opinion, unless it be for the first few days following the operation.

There has long been a need for some good agent to use on the hands and arms and external surfaces of the patient during obstetrical operations and the removal of secundines. We have found this solution very satisfactory for this purpose. We have used it as a first step in the preparation of the hands and fields of operation

but have not depended upon it alone. In irrigations of the uterus and of wounds not well drained we have had some embarrassing experiences.

Case 1. Severe wire cut sixteen inches long and four to five inches deep across the shoulder over the scapulo-humeral articulation completely severing the mastoido-humeralis. The wound was irrigated two to three hours daily until granulation was well started. It was then treated with dry dressing. Nearly united at the end of three weeks.

Case 2. Bay gelding. Fistulous withers. Operated upon 1-30-17. Wound treated with chlorazene and later by iodin and sent home at the end of four weeks in prime condition. Two months later the case was returned with a hard swelling in front of the arm which later spread over the region of the sternum and to the top of the withers. It rapidly became worse until the entire shoulder region was enormous in size. The swelling was hot and pitted upon pressure, there were apparently no cold areas but it felt emphysematous to the touch. Clinically it was diagnosed as malignant edema but was not confirmed in the laboratory. Incisions were made over the point of the shoulder and posterior to the elbow. The solution was introduced at the top of the withers and escaped from the wounds below. In a few days the swelling subsided and considerable sloughing took place. Long ribbons and shreds of connective tissue were removed. Pus continued to flow for a week or more. The wounds over the shoulder and back of the elbow closed. Considerable induration tissue was removed at the top of the withers and the wound drained in front of the scapula. Smooth surfaces developed in this wound which refused to granulate and the case assumed the usual course of fistulous withers. At the end of six months after the first operation it was still under treatment but steadily improving.

Case 3. Poll evil. Bay mare operated upon 6-1-17. Wound irrigated two hours daily until nearly healed. Sent home at the end of thirty days.

Case 4. Brown mare. Poll evil. Operated upon 6-9-17. Wound irrigated two hours daily for twenty-five days. Complete recovery.

Case 5. Gray mare. Puncture wound extending from above the coronet into the sensitive laminae. Steel sliver removed. Wound dressed three times daily with Dakin's solution and re-

bandaged. Severe lameness disappeared and case sent home in three days.

Case 6. Bay gelding with large emphysematous and edematous swelling over the scapula. Diagnosed clinically as malignant edema. Two incisions five inches long were made over the lower part of the wound and the original wound or source of infection was laid open. All wounds were irrigated almost continuously for the first twenty-four hours. At the end of forty-eight hours the swelling had started to subside and the case made an uneventful recovery.

Case 7. Poll evil. Gray gelding. Operated upon March 1917. Treated with iodin, healed and "broke out again". Incision made to drain the abscess and the wound irrigated two hours a day for fifteen days. All discharge had ceased and only a skin wound was left.

Case 8. Bay mare with a fistulous tract from the mouth into the nasal meatus, of two years standing. Food had been forced into the meatus until air could no longer pass through and there was a very fetid odor. Tracheotomy was performed and the animal anesthetized. A trephine opening was made over the tract and a tumor about the size of an orange removed from the end of the turbinated bone. Considerable difficulty was experienced in removing the food but it was finally washed out. An effort was made to pack the tooth cavity in order to prevent the food from again filling the meatus but this was unsuccessful. The wound was irrigated twice daily with Dakin's solution and the food removed. The fetid odor rapidly disappeared and finally the communication between the mouth and the meatus closed.

Case 9. Bay mare. Fistulous withers. Operated upon according to the technique described by Dr. Bemis. The wound was irrigated daily with Dakin's solution for six weeks. Discharge had nearly ceased and the case was dismissed.

Case 10. Black gelding. Fistulous withers. Operated upon 7-7-17. Irrigated daily with Dakin's solution. Still some flow of pus after six weeks.

Case 11. Shoulder abscess with large amount of fibrous tissue, the whole tumor was about the size of a man's head. The entire mass was removed and the wound irrigated twice a day for two weeks and then treated with dry dressing. Dismissed nearly closed at the end of fifteen days.

Case 12. Wound over the posterior part of the fetlock joint

involving the sesamoid sheath. Considerable escape of synovial fluid. Case presented for treatment immediately after it was made. Irrigated with Dakin's solution for ten days. Discharge had ceased and dry dressing completed the treatment. Entirely closed at the end of three weeks.

Case 13. Open tendon sheath. Kicked over the tendon of the lateral extensor of the digit as it passes over the hock. Treated by the owner for two weeks. Hock very much enlarged by induration and three wounds about the hock discharging synovial pus. Not much lameness. One abscess opened surgically and all tracts irrigated with Dakin's solution. The discharge ceased at the end of ten days and the case made a complete recovery except for the induration.

Case 14. Puncture wound. Roof of a shed fell upon a yearling Percheron colt driving a spike eight inches into the lumbar region. It is probable that the peritoneum was not punctured. Treated by the owner for one week. Presented for treatment, discharging a large quantity of yellow pus. Rectal examination showed a diffuse swelling over the lumbar region and flank. The wound was irrigated with Dakin's solution. A rubber catheter was used to get the fluid to the bottom of the wound. No improvement. An attempt was made to establish drainage through the flank. The pus changed from yellow to sanguineous, the area became hot and the colt lost flesh. Further attempts were made to reach the bottom of the wound with drainage but the animal died. Autopsy showed a subperitoneal abscess that extended from the ilium to the kidney.

Case 15. Pyometra. Case of one year standing. Did not respond to dilatation of the cervix and irrigation with solutions of boric acid and other mild antiseptics, nor to the introduction of boric acid and iodoform, nor to proprietary capsules recommended for that purpose. Irrigated with Dakin's solution in strengths from .03% to .13%. The discharge changed from fetid and yellow to sanguineous. After three weeks' treatment the mare died.

These cases are fair instances of the conditions we have seen treated with Dakin's solution. We realize that our technique has been very crude and that under the existing conditions we could hardly expect better results. We believe, however, that an advancement has been made in the treatment of wounds and that still further improvements will be made.

FAGOPYRISMUS (*BUCKWHEAT POISONING*) AND SIMILAR AFFECTIONS

E. A. Bruce, Agassiz, B. C.

While it is generally accepted that varieties of buckwheat (*Fagopyrum*) may cause constitutional disturbance, opinions are not so well formed where other species of the *Polygonaceae* are concerned. This phase of the question will be discussed shortly, when it will be shown that *Polygonum persicaria* (Lady's Thumb), *P. hydropiper* (Smartweed), etc., are not as toxic as some authorities have claimed.

Fagopyrismus is an erythema of the unpigmented skin, often accompanied by nervous symptoms, and which sometimes ends fatally. Its production requires the following factors:—(1) Unpigmented skin, (2) ingestion of buckwheat, (3) direct sunshine.

Somewhat similar conditions may be produced by species of alfalfa (*Medicago*), clover (*Trifolium*), St. John's Wort (*Hypericum*), and Knotweed (*Polygonum*).

Quite recently (August) an outbreak of buckwheat poisoning in pigs belonging to the University of British Columbia, was brought to my notice through a letter of inquiry from Dr. G. Howell of Vancouver, B. C. In the letter referred to, the following facts were given:—A number of pigs had been running on a pasture of rye grass and other green foods for ten weeks; they were then moved to a similar pasture which contained in addition buckwheat in flower. They were on this latter feed only 24 hours when symptoms developed. The ages ranged from 3 months to aged brood sows and all exhibited the same symptoms. The younger pigs were affected first.

The symptoms given were as follows:—Acting in a peculiar manner as if suffering from brain trouble. They would try to jump out of the enclosure, jump into the air with all four feet off the ground, shake their heads and squeal, then poke their heads against the pen or under a log, then lie quiet for three or four minutes when they would begin again. At times their hind legs were partially paralyzed. In addition I elicited the information that their skins showed a rash and that they were white animals (Yorkshire). While the feeding of buckwheat was suspected by Dr. Howell as being the cause, the true nature of the disease was not

realized, as he states that upon the following morning the pigs appeared much better, ate some food, *and were turned out on a ploughed field in the hot sun* without shelter of any kind. In a few hours they showed the same symptoms as stated above, but not quite so well marked. This outbreak of fagopyrismus, interesting in itself, is all the more so as having occurred at a university possessing a faculty of agriculture, which fact would indicate that the toxic properties of buckwheat are not so well known as might have been supposed.

Little is known of this so-called *Fagopyrism*, but after analytical and spectroscopical researches on the coloring matter of the tegument Kurt concluded that it is due to the chlorophyll (Long). The two main views that have been advanced as to the cause of the condition are; firstly, that parasitic fungi growing on the buckwheat are responsible, either directly or through their toxins, and secondly, that the cutaneous reaction is produced by toxins which circulate in the blood. These toxins injure the vaso-motor nerves under the influence of the sun's rays, in skin which is not protected by pigment. The same toxins are supposed to cause the nervous and digestive disturbances. Cases observed by Rabe and others in which epileptiform fits were seen in horses and pigs, without any accompanying skin eruption, seem to indicate the presence of some narcotic poison in buckwheat (Friedberger & Fröhner). While all parts of the plant may cause trouble, there appears to be but little doubt that it is most toxic when in flower. Fatal cases have occurred in oxen, sheep, pigs and rabbits. The sickness is commonest in white and white-spotted sheep, especially lambs, also in pigs; is rare in goats and cattle, and very rare in horses. Animals with pigmented skins do not suffer, and white animals show no ill effects if kept out of direct sunshine. Even when the feeding of buckwheat has been discontinued for ten days, or for two or three weeks, the eruption will develop if susceptible animals are exposed to the sun. The more buckwheat an animal has eaten and the hotter the sun, the greater will be the reaction.

Symptoms. In mild cases there is erythema and slight inflammatory swelling, accompanied by intolerable itching. The region of the head and ears being the most commonly affected. In the severer cases there may be some disturbance of breathing, digestive trouble and symptoms of brain affection. Death may result in 12 hours.

Treatment. Affected animals should be moved at once to a shady situation. As a rule recovery takes place in a few days, but the severer cases should receive treatment to reduce the inflammation of the skin, especially those showing brain or general symptoms.

Similar affections. Trefoil Dermatitis. This disease is reported by Dodd as affecting domestic herbivora in New South Wales after the ingestion of *Medicago denticulata* (Bur Clover). The factors necessary for its production are that the food must consist mainly of trefoil, the animal must possess unpigmented skin, and such skin must be exposed to the direct rays of the sun. The parts affected are invariably cutaneous, and the causative agent disappears from the system in a few days; in both these respects it differs from the disease due to buckwheat. In sheep the common sites for the lesions are the back, ears, nostrils and mouth. In cows the udder and teats are occasionally affected. In horses the nose and the lower extremities.

I am not aware that *Medicago denticulata* has been reported as causing trouble of this nature in America, but *Medicago sativa* (alfalfa) has caused an inflammatory edema, followed by scab formation on the white noses and fetlocks of horses in the dry belt of British Columbia. Numerous complaints have also been received from the dry belt as to the unsuitability of alfalfa as a pasture for white pigs.

Clover disease. In Europe animals feeding on alsike clover (*T. hybridum*) or on red clover (*T. pratense*) suffer from a disease closely resembling that produced by *Medicago denticulata.* The affection has also been noted in Ontario in horses feeding on alsike. Mild cases consist of an inflammation of the unpigmented skin, especially of the head and limbs. Severer cases accompanied by nervous and digestive disturbances, sometimes ending fatally, have been reported in Europe for horses and lambs after feeding on alsike clover. Cases of this nature have also been reported in the U. S. A. as occurring in horses and mules.

Hypericum species. Rogers in an article entitled "The Action of St. John's Wort as a Sensitising Agent for Unpigmented Skin", describes a condition which is very similar to that caused by buckwheat, alsike, bur clover and alfalfa. Pammel states that it is said to cause eruptions on cows' udders and on the feet of white animals. Fatal cases have been reported as occurring in horses.

Polygonum experiments. The experiments which follow were brought about through the following incident: Towards the last of May 1916, some 19 Holstein heifers belonging to the Experimental Farm here, were running in the woods adjoining the farm. On May 30th three of these animals were found to be suffering from a dermatitis which was confined to the white parts of the skin. Only those parts directly exposed to the sun's rays were affected, viz., loins, back, neck and muzzle. The two worst cases had a temperature of 104°F., and a conjunctivitis. Where black haired skin met with the line of demarkation was perfect, the black parts being perfectly normal and the white badly inflamed. The affected animals were first seen by Dr. S. Hadwen who diagnosed the disease as being akin to fagopyrismus. The worst case was treated with copious applications of carron oil, and made a slow recovery. The other two cases received no treatment but were kept under observation. The affected skin all peeled off, and in one animal a patch about 10 inches square in the region of the loin was so badly damaged that no hair has grown on it since. Examination of the woody pasture where these animals had been running revealed no plants suspected of causing such trouble outside of a number of the knotweeds (*Polygonum sps.*).

In an effort to find the origin of the disorder, the following experiments were conducted, which while they proved nothing as to the cause of the trouble in the heifers, were nevertheless instructive.

On July 18, three white pigs were placed in the shade and were fed until the morning of the 28th as follows:—one served as a control and was fed on mixed grasses and shorts, the second was fed on shorts and red clover (*T. pratense*), the third received shorts and lady's thumb (*P. persicaria*). On July 28th they were placed in pens so situated that they could not get out of the sun, and were put on ordinary feed. The next day the ears of all the pigs were reddened, those of the lady's thumb pig being slightly the worst.

On the 30th the lady's thumb pig's ears were inclined to be purplish and small blisters had formed. The clover pig was reddened around the eyes and ears. After this very little difference could be noticed between the pigs, all of them showing sunburn to a greater or lesser extent. On August 4th the ears of the pig fed on lady's thumb were slightly scabbier than those of the others.

An experiment was then started with the same pigs, keeping them in the open all the time. They were fed as in the previous

experiment. On the 7th the control pig, which had broken through to both the other pens several times, was put on a diet of smartweed (*P. hydropiper*) and shorts, after being properly secured. Feeding was continued until the 23rd, when it was abandoned, no results having been obtained.

On August 10th a yearling Holstein bull, an animal with a great deal of unpigmented skin, was placed in a pen in the open, and was fed until August 28th on the following:—Feeding was confined to plants of the *Polygonaceae*, those mainly fed were *Polygonum persicaria* and *P. hydropiper*, but a quantity of the following species were also given, *P. aviculare*, *P. acre* and *P. hydropiperoides*. On August 28th the experiment was discontinued as the animal showed no ill effects. Of the plants fed the animal showed a preference for *P. persicaria* over all the others; with the pigs this plant was eaten more readily than *P. hydropiper*.

Summary. While careful weighing tests were not made, a conservative estimate of the amount of plants eaten in the various experiments are as follows: Pigs fed for ten days in the shade. Two experimentally fed, one control. *P. persicaria* (Lady's Thumb), 70 lbs. (Pig No. 3). *T. pratense* (Red Clover), 70 lbs. (Pig No. 2). Pigs fed for nineteen days in the open air. The control (Pig No. 1) was only fed for sixteen days, and was the smallest animal of the three. *P. persicaria*, 135 lbs. (No. 3). *T. pratense*, 135 lbs. (No. 2). *P. hydropiper*, 90 lbs. (No. 1).

A yearling Holstein bull was fed for eighteen days in the open air on an exclusive diet of *Polygonum* species. *P. persicaria*, 140 lbs., *P. hydropiper*, 140 lbs., *P. aviculare*, 40 lbs., *P. acre*, 30 lbs., *P. hydropiperoides*, 10 lbs. Total, 360 lbs.

As these experiments were negative in so far as the production of ill effects were concerned, it would appear that either the toxicity of *Polygonum sps.* has been overestimated or that some animals are peculiarly susceptible to their action.

Pammel states (re Polygonum) that "none of the species is relished by stock; the *P. acre* and *P. hydropiper* are very acrid and produce gastro-enteritis and erythema, like that caused by buckwheat. The following species produce similar troubles. *P. hydropiperoides* and *P. hydropiper*". He also states that the last mentioned species and *P. aviculare* are said to be troublesome to sheep. Long mentions that *P. persicaria* and *P. hydropiper* are said to cause a rash, and to contain narcotic substances. Further

he states Persicaria is said by Muller "to have caused inflammation of the bladder and the digestive tract in pigs, and water-pepper (*P. hydropiper*) to have caused hematuria; fatal results have followed. Pott records similar symptoms". Friedberger and Fröhner in reference to fagopyrismus state that "the original cause is to be sought in the eating of buckwheat or of other polygonum species". Lander in referring to the *Polygonaceae* says: "Some species of this order are held to be responsible for poisoning. although the records, and our knowledge of the active principles are scarcely such as to give the basis of a well-founded narrative". This authority makes no reference to the alleged toxicity of the knotweeds, but mentions the disturbances due to the ingestion of buckwheat; he also mentions species of *Rumex*, and says that these plants are well known to contain oxalates, which may account for alleged poisonings. *En passant* I may say that the theory recently advanced by S. Hadwen that species of *Rumex* and other acid plants, are responsible for hematuria in cattle after prolonged feeding (usually several years), appears to be well founded.

In conclusion: the toxic properties claimed for the knotweeds (*Polygonum sps.*) have not been substantiated by the experiments conducted at Agassiz.

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UMBILICAL INFECTION WITH ABSCESS OF HEART DUE TO MICROCOCCUS

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Patient was a four weeks old lamb in an emaciated condition. The left hock was swollen and painful so that no weight was placed on this leg in walking. There was a swelling about three cm. in diameter on the right side just posterior to the shoulder and above

the spur vein, also a large swelling about 10 cm. in diameter in the region of the umbilicus.

The animal was killed and a post mortem made. The heart muscle on the right side contained two abscesses about one cm. in diameter. One of these abscesses extended between the lobes of the lung and the chest wall and passed out between the fifth and sixth ribs to communicate with the swelling on the right side posterior to the shoulder. The lung was adherent to the chest wall in this region. The end of the umbilical cord contained an abscess while the umbilical ring was about four inches long through which a hernia had developed. The left tarsal joint was hemorrhagic and thickened containing synovia mixed with pus. The joint cartilage was eroded in several places. The capsule of the right carpal joint was inflamed and contained pus and synovia.

Cultures made from the abscesses of the heart and umbilicus gave a pure growth of micrococcus.

PATHOLOGIC CONDITIONS NOTED IN LABORATORY ANIMALS*

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In experimental investigations it is usually desirable to employ only normal animals. However, this ideal condition is scarcely ever fully obtained and in laboratories in which a large number of animals are used the accidental procuring of diseased ones seems unavoidable. It is, therefore, necessary in all experimental work to routinely perform autopsies on the animals employed in order to determine whether the results of the experiment were complicated by disease. In reviewing the detailed protocols of the experiments in many investigations it is surprising to note the large number of experiments in which the animals used were diseased. It is possible that some of the contradictory data on problems of physiology, pathology and experimental medicine, and surgery are due to this cause.

The pathologic conditions noted in our laboratory animals have been varied but in this report we shall confine ourselves to a few

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cases showing some of the rarer pathologic conditions found while doing routine autopsies. These cases are not presented as a statistical study because it is obvious that from a statistical standpoint such data cannot be compared to those obtained at large veterinary hospitals. In this presentation we have two objects in view, one of which is to place on record a few pathologic findings which may be of value from the comparative standpoint. We are firmly of the opinion that the greatest progress in physiology and pathology will not be made until greater advantage is taken of a comparative study of these subjects. The other object in making this report was to inform the veterinarian who sees so many of these conditions that the research laboratories are interested in comparative pathology.*

CARCINOMA. While many cases of malignancy in laboratory and domestic animals have been reported, the number is relatively small compared with those in the human being. Besides the possibility that malignancy does not occur as frequently in these animals as in man, two other probabilities must be considered. The majority of these animals are slaughtered when young and a relatively smaller number reach an age which would compare with the "cancer age" of man. Another reason why malignancy is not reported more often in animals is because only a relatively small number of necropsies are held on animals that may have died of cancer. Only one case of cancer has been found in our series. This appeared to be primary in the pancreas:

Cat 32. December 8, 1915. White, castrated male cat, about 12 years old, weight 2.9 kg. The cat was brought to the laboratory to be sacrificed. There was a slight ulcerated area just below the base of the left ear. The teeth were almost all gone. The abdomen was markedly distended and contained fluid. The animal was killed by etherization. On opening the abdomen about 1500 c.c. of light colored fluid escaped. The omentum was covered with light colored, hard, scattered nodules about 2 to 5 mm. in diameter. The liver contained several raised, light colored areas, ranging from 0.5 to 4 cm. in diameter. These areas had the characteristic appearance of carcinomatous metastasis to that organ. (Fig. 1).

The pancreas was small; the tail of the gland was hard and did not appear to contain very much glandular tissue but mainly connective tissues. The head of the gland was firm and contained

*An interesting study of tumor formation in old animals has been made by Goodpasture and Wislocki. Jour. Med. Res., 1915-16, xxxiii, 455.

many large areas similar to those in the liver. The ducts were involved in this mass.

The stomach contained a small papilloma on its anterior surface near the pylorus. The kidneys showed well marked chronic nephritis. The aorta showed some light areas of atheroma; all other organs were grossly normal.

Microscopic examination. No evidence of carcinoma was found except in the pancreas and liver. The areas noted grossly in the pancreas and liver were shown microscopically to be definitely malignant. The carcinomatous cells were rather small and very closely packed together. An exceedingly large number of cells were undergoing mitosis. (Figs. 2, 3 and 4). While it is impossible to state definitely it appeared that the carcinoma was primary in the head of the pancreas.

Gallstones. While gallstones have been reported as occurring in laboratory animals they seem to be quite rare in the dog. Two dogs in our series had gallstones.

Dog 979.* June 26, 1914. An adult female fox terrier, weight 6 kg. The gallbladder was removed in order to determine the effect of cholecystectomy on the biliary ducts. The animal recovered quickly from the operation and seemed normal in every respect. On October 28, 1914, 124 days after the operation, the animal was killed in a fight. Autopsy was performed soon after death. The dog was fat and in good condition. The operative wound was completely healed. On opening the abdomen a number of adhesions were found at the site of operation but they offered little resistance to dissection. The liver appeared normal but was rather pale in color. The end of the cystic duct could not be found. The common and hepatic ducts contained stones. Three stones about 2.5 mm. in diameter were found near the opening of the common duct into the duodenum. At the juncture of the three hepatic ducts there was a mass about 1 cm. long and 6 mm. in diameter, composed of a very large number of green and yellow stones, the largest of which were about 1 mm. in diameter. All other organs were grossly normal except for the effect of the fight. (Figs. 5 and 6).

The gallbladder of another dog in our series contained one small, hard, dark colored gallstone about 0.5 cm. in diameter.

Pancreatitis. Slight chronic pancreatitis was noted in several

*This case has been previously reported by Judd and Mann, S. G. O.

of our older animals but in one there was a rather acute condition.

Dog B932. April 4, 1917. Black and brown mongrel, male, weight 12.7 kg. This animal seemed normal and was prepared for an operative experiment. When the abdominal cavity was opened, however, the following conditions were discovered: The pancreas was exceedingly firm and slightly nodular. This was especially true of the head although the entire organ was involved. The surrounding lymph nodes were slightly enlarged.

The spleen showed three new growths just under the capsule and projecting on the free surface. The largest was about 2 cm. in diameter. The other two new growths were only about 1 cm. in diameter. Specimens were taken from the pancreas and the tumor in the spleen.

The dog recovered from the immediate effects of the operation but did not do well and died April 6, 1917. The post-mortem showed little more than was noted at the exploratory operation. In the kidneys were some small scars of an old infarction. The urine was free from sugar but contained a slight amount of albumin. Except for the pancreas, spleen, and kidneys, all the other organs were grossly normal. The tumors found in the spleen are similar to those found in the spleens of several other dogs. They have been termed lymphomas.

Microscopic examination. The surface of the pancreas is covered with a thin layer of fibrinous exudate. The interlobular connective tissue has increased and there are large numbers of round cells infiltrating it. In many areas there is an actual necrosis. All the remaining acinar cells are swollen. (Figs. 7 and 8).

ATRESIA OF THE VAGINA AND BODY OF THE UTERUS. One of our dogs presented a markedly dilated uterus due to an atresia of the vagina and body of the organ which was interesting.

Dog B702. March 27, 1917. Black and white, female fox terrier, weight 8 kg. The animal had been used for previous operative experiments, none, however, affecting the genital organs. The dog was etherized. Autopsy showed an atresia of the vagina and body of the uterus. Both horns of the uterus were dilated and contained fluid. The right horn measured 12 cm. in length and the average diameter was 1.5 cm.; the left horn measured 15 cm. in length and had an average diameter of 2 cm. (Fig. 9). The kidnews showed marked interstitial nephritis.

PATHOLOGICAL CONDITIONS NOTED IN LABORATORY ANIMALS

Fig. 1. Photograph of under surface of liver of Cat 32 showing many areas of carcinoma.

Fig. 2. Photomicrograph of a section taken from one of the areas shown in Figure 1. Note the absence of any liver cells and the large number of mitotic figures. X240.

Fig. 3. Photomicrograph of section of pancreas of Cat 32, showing an area of carcinoma in that organ. There are only a few pancreatic cells shown. X120.

Fig. 4. Photomicrograph of section of pancreas of Cat 32. Note that one duct is patent and the marked increase of connective tissue throughout the section. X120.

Fig. 5. Photograph of under surface of liver of a dog 979, 124 days after cholecystectomy. a, Stone in the common bile-duct. b, Small stone in the ampulla of Vater.

Fig. 6. Photograph of same specimen as shown in Figure 5. The common duct has been opened exposing the stone.

Fig. 7. Photomicrograph of section of pancreas of Dog B932. Near the center of the section is a normal appearing island of Langerhans. Surrounding this are a few acini, the cells of which are swollen. The interlobular tissue is markedly infiltrated.

Fig. 8. Photomicrograph of section of pancreas of Dog B932, showing one of the many areas of necrosis. No normal pancreatic tissue is present.

Fig. 9. Photograph of uterus of Dog B702, showing the dilated horns due to atresia of the body of the organ.

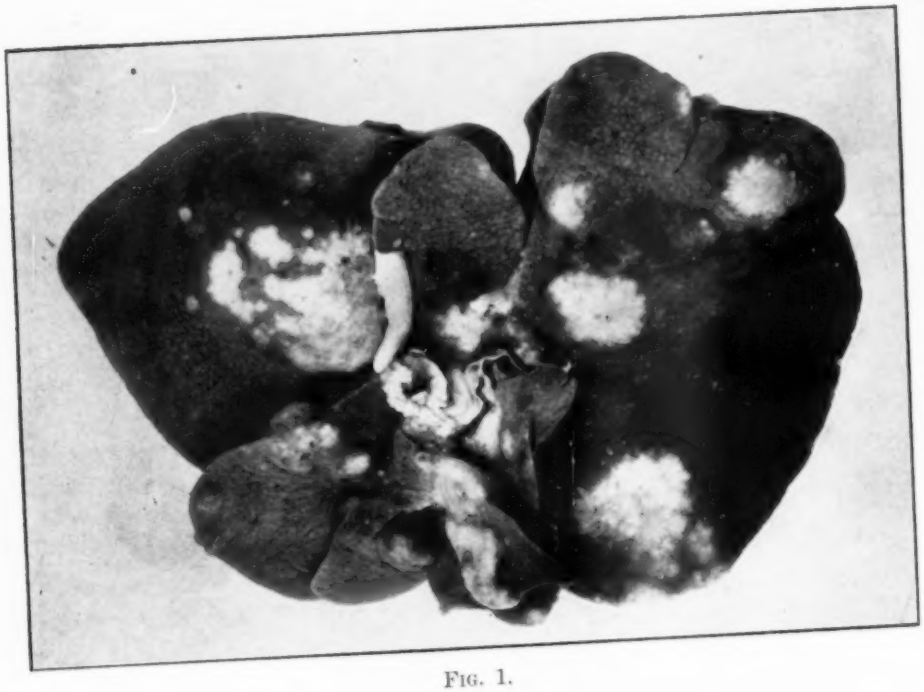

FIG. 1.

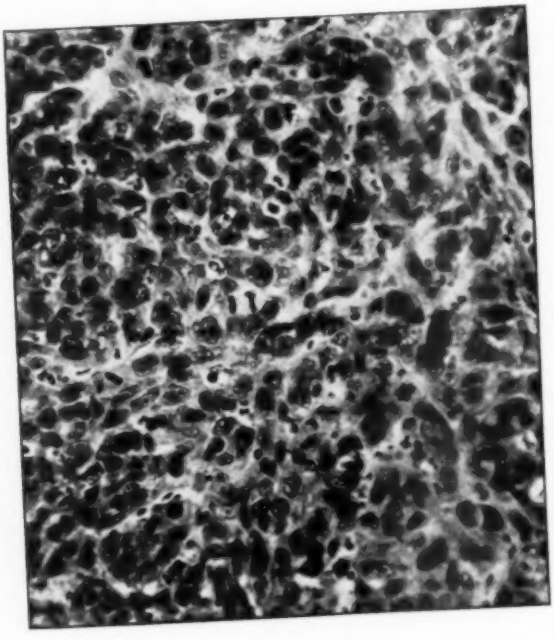

FIG. 2.

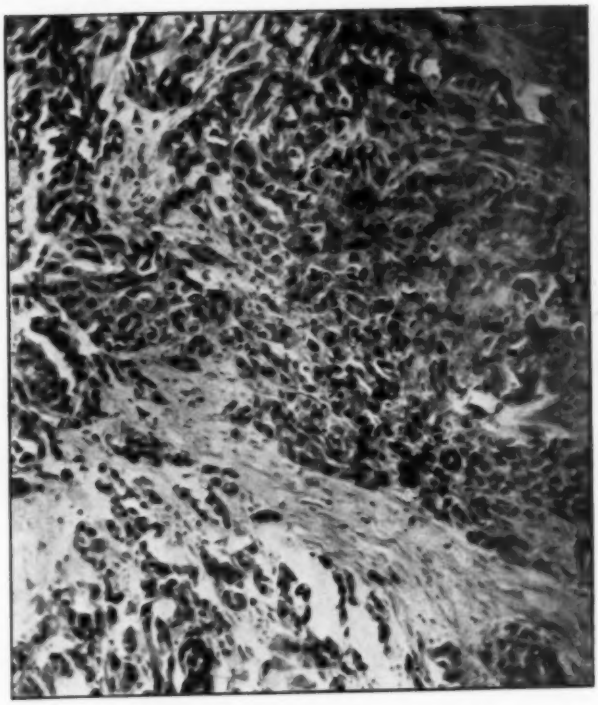

FIG. 3.

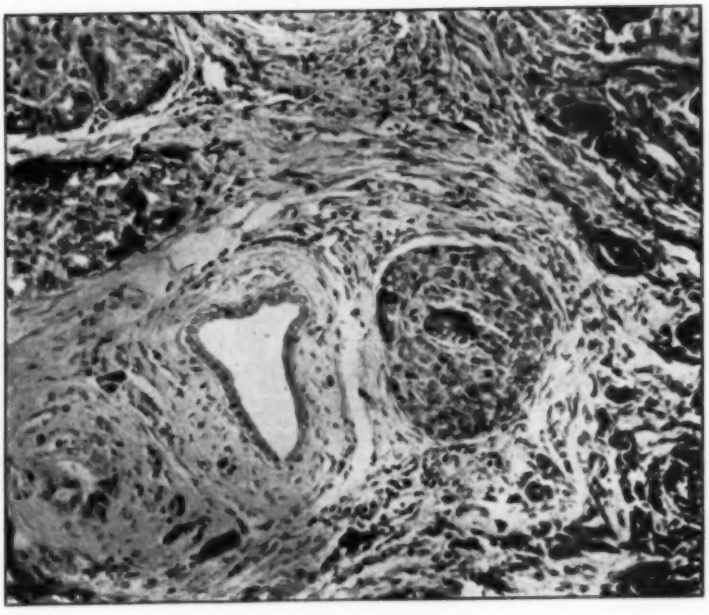

FIG. 4.

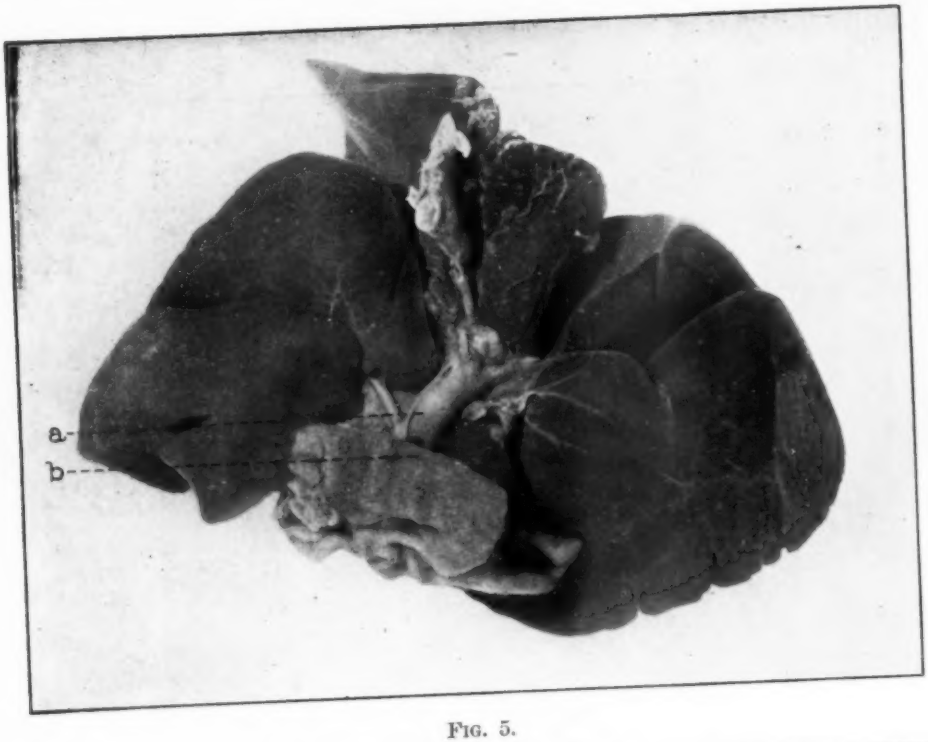

FIG. 5.

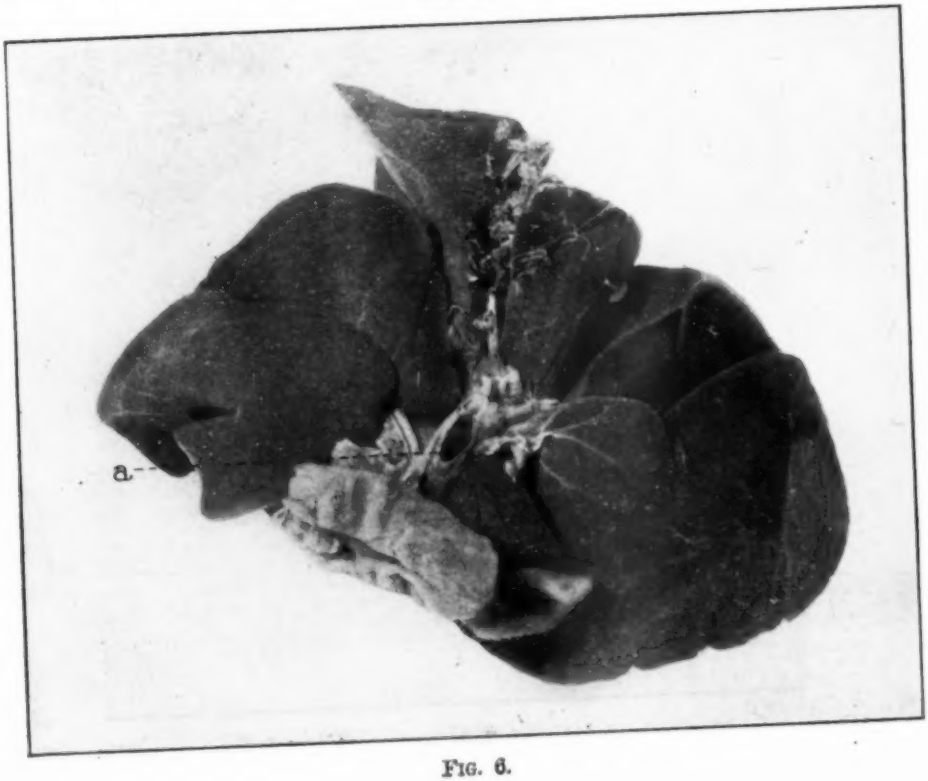

FIG. 6.

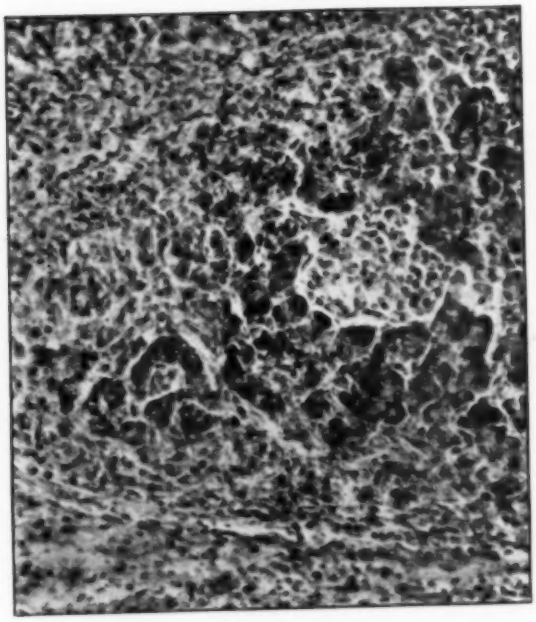

FIG. 7.

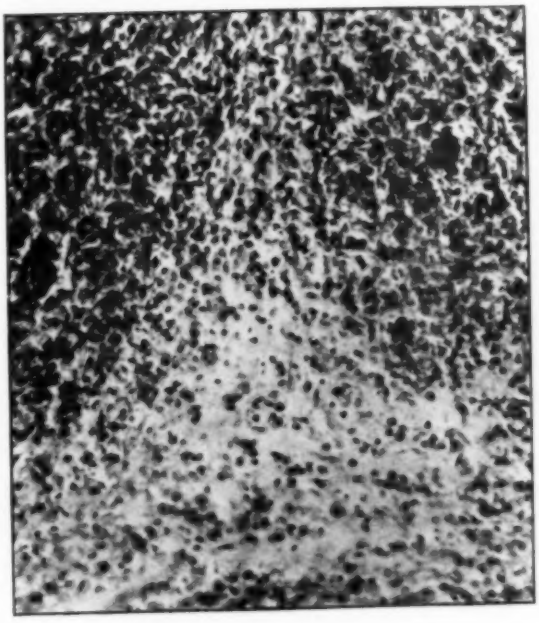

FIG. 8.

FIG. 9.

ABSTRACTS FROM RECENT LITERATURE

Tuberculosis in Horses. Capt. F. Chambers, F. R. C. V. S., A. V. C. *Veterinary Journal.*—The author saw four cases in six months. The diagnosis was made only on post-mortem. "Tuberculosis is so rare in horses that one seldom suspects the presence of the disease unless the animal exhibits that marked stiffness of the neck, caused by an ostitis and periostitis which has come to be recognized as a striking symptom of the disease." One of the four cases had sand colic; he died with pneumonia. All of the horses were much debilitated. The post-mortem revealed lesions of tuberculosis in various forms. The cases were put in record as the author considers that it would save time and expense if all cases of debility that do not make headway in a few weeks were tested for tuberculosis. While one may consider that tuberculosis in the horse is by no means common, one can also realize that it is more prevalent than is usually thought. A. L.

Equine Sarcoptic Scabies in Man. Thomas Parker, F. R. C. V. S. *Veterinary Journal.*—This is the record of three cases of sarcoptic manifestations contracted by men from horses.

(a) The first was on the author. The possible contagion was doubted by some commanding officers. To convince them, Parker took a number of deep scrapings from the skin of horses and mules affected with scabies, examined them under the microscope and found numerous live sarcoptes. A day or two after his arms were covered with the eruption of a sarcoptic nature, which was relieved only by liberal washings and frequent applications of a solution of perchloride of mercury.

(b) The second case was observed on a groom who had cared for a horse suspected of having mange which belonged to an officer. The groom had a number of small spots on his arm which were very itchy and which disappeared after treatment. The horse developed mange later on.

(c) In one stable eight horses had the mange. The horse-keeper had both arms covered with numerous hemorrhagic spots, which were very itchy, principally at night. A. L.

Osteomalacia in Cows. In the Review of the Minister of Industries, Republic of Uruguay, Dr. M. C. Rubino, departmental veterinary inspector, reports a peculiar disease of cows. The dis-

ease appears in summer and autumn (February, March and April) and only attacks cows with calves.

The first symptom noted was difficulty in moving the forelegs, any movement causing intense pain. The cow seemed to be suffering from acute laminitis. There was a marked atrophy of the shoulder muscles. The cow became cachectic and there was swelling of the joints, particularly the shoulder, and an enlargement of the body of the scapula resulting in fracture of the bone in some cases. The acute symptoms gradually subsided and most cases recovered in two or three months, although some remained permanently lame.

Autopsy revealed general cachexia, atrophy of the muscles of the forelegs and particularly of the scapula. The principal lesions were in the osseous system. The bones appeared osteomyelitic, were enlarged, and soft, with absorption of the calcareous part leaving openings in the bone. The medulla was red, soft and fragile. The periosteum was hyperplastic and easily removed, showing the porous bone.

The cause of this disease has not been demonstrated.

N. S. M.

Notes on Cases. Arthur New, M. R. C. V. S.. *Veterinary Record.*—(1) Broken Back.—While backing a load of coal, a mare slipped, recovered herself and was sent home. When she arrived and while being taken out of the harness, she staggered, fell and was unable to rise. She grew very much worse later in the day and was destroyed. At post-mortem, there was found a considerable extravasation of blood in the lumbar region and a fracture between the last dorsal and the first lumbar vertebrae.

(2) Rupture of the Heart. Answering a call, said to be a case of colic, the author arriving half an hour after, and found a six year old cart horse dying. He had eaten breakfast and half an hour later had manifested symptoms of colic. The heart and the pericardial sac were secured and in the right auricle was found an irregular rent about two inches long and the pericardial sac full of clotted blood. The cardiac tissue was quite healthy.

A. L.

Post-Mortems. Canis Major. *Veterinary Record.*—1st. An eight year old cat was destroyed because of poor condition and unfavorable prognosis, a foreign body in the bowel. A tumor,

probably tuberculous in its origin and about the size of a walnut, was found in the mesentery.

2nd. Chronic enteritis was found in a six year old Airedale terrier. A diagnosis of ascites had been made with unfavorable prognosis.

3rd. Small tumors were found in a retriever destroyed because of a poor condition and chronic diarrhea. One of the growths was also found in the abdominal cavity.

4th. A large cystic growth was the only lesion found in a dog which had peculiar symptoms during life: after a short walk he would stop, raise the right hind leg and at the same time turn the head around towards the right flank and remain in that position for a whole minute, exhibiting much pain. Then he resumed walking and after a short time exhibited the same manifestations. The dog was destroyed, the owner refusing exploratory laparotomy.

5th, 6th, 7th. Number 5 had chronic nephritis and chronic cystitis. In the sixth the spleen contained ten small prominent, rosy growths whose nature was not made out. The seventh had sarcoma of the liver. A. L.

HOG CHOLERA: PREVENTION AND TREATMENT. M. Dorset and O. B. Hess. *Farmers' Bulletin 834.* U. S. Department of Agriculture.—Hog cholera is found in practically all parts of the world. Severe outbreaks may occur in the South in any season of the year. Other sections show the greatest heights during October and November. February marks the lowest point. The average annual loss for the last 40 years approximates the sum of $30,000,000. Hog cholera can be produced only by a specific microorganism present in the blood, urine, feces and the eye and nose secretions. Insanitary surroundings and improper feeding contribute to the disease but cannot cause it. Hog cholera may be acute or chronic. All the hogs in the herd do not become sick at once. The sick ones remain hidden, the backs may be arched and they may appear cold and shiver. They are weakened as the disease progresses and the weakness is greatest in the hind legs. There may be a cough. Eyes are inflamed and show a whitish discharge. Constipation is commonly present in the early stages and is followed by diarrhea. Temperature is an important symptom. The normal is 101° to 104°F. 104° to 107°F. and even

higher is not uncommon in cholera. There are several important changes found in the carcass after death. These are purple blotches on the skin, blood colored spots on the lungs, surface of the heart, kidneys, intestines and stomach. There is reddening of the lymphatic glands and ulceration of the inner lining of the large intestine. Enlargement of the spleen occurs in acute cases. Swine plague, tuberculosis, anthrax, necrobacillosis and worms give rise to symptoms that may be mistaken for those of cholera. Man, other animals, birds, streams and shipping equipment may serve to carry the infection to sound herds. Proper sanitation will go far toward excluding cholera. No drug or combination of drugs can be regarded as a preventive or cure for hog cholera. "Anti-hog cholera serum" is the only reliable preventive. There are two systems used in protecting hogs. One is the "serum-alone inoculation", the other is the "simultaneous inoculation". Using either of these methods the work must be done under all antiseptic precautions. The temperature of the hogs should be taken both before and after treatment. This method protects the serum maker, the owner of the stock, and the operator if animals already carrying temperature suffer loss. There is little danger in the serum-alone inoculation, but the immunity conferred is short. The simultaneous method is more dangerous but has the advantage of conferring a more lasting immunity. Pregnant sows are shown to have been inoculated by either method without causing an undue amount of abortion. Sterility does not result from inoculation. It is advisable to immunize all new stock brought to the farm within 90 days after the old stock has recovered from an attack of the disease. Ultimately cholera should be entirely eliminated; but for the present it seems wiser to consider control rather than eradication.

HAYDEN.

RICKETS IN DONKEYS—REMARKABLE DISTORTION OF THE NECK IN A FOAL. R. Paine, F. R. C. V. S. *Journ. of Comp, Pathol. and Therap.*—The writer is a Government Veterinary Officer at Aokstad, Union of South Africa—he reports that, in the Transkeian Territories, rickets is extremely common in donkeys and that it does not affect horses nor cattle. Healthy at birth, the little donkey shows its deformities only when six to nine months old. The knees gradually incline inward or more rarely outward, and when the animal is two or three years old the fore legs may cross one another to a considerable distance.

The other case is that of a three year old colt, which had been "*rareyed*" the day previous. The colt was unable to raise its neck and there was a large bulge in its course just in front of the shoulder. By careful raising of the head, the neck could be straightened but returned to its abnormal position as soon as the support was let go. Attempts were made to treat him with iron splints but they failed and the animal was destroyed. There was found, at post-mortem, extensive injuries of the muscles of the off side of the neck. The bones were normal. A. L.

PECULIAR CASE OF A FOREIGN BODY. Capt. W. T. Oliver, A. V. C. *Veterinary Record.*—It was reported that a flat substance like a button had gradually worked its way up the shoulder of a horse recently bought. Indeed this body was distinctly felt under the skin, behind the spine of the scapula. It was cut down upon and from under the skin and underlying tissues there came out a ten cent piece stamped "Canada 1916". How did that coin get there? A writer of the *Record* suggests very wisely that the horse was treated in Canada for what is called *sweenied shoulder,* the treatment of which is variable, by the introduction of foreign substances or of insufflation, etc., in some parts of the country. A. L.

TREATMENT OF ANTHRAX IN MAN WITH NORMAL BOVINE SERUM. Kraus and Beltrami. *La Prensa Medica Argentina,* Vol. 3, Nos. 21, 26, 27, 28, 1916.—These investigators have made an apparently careful study of the preparation, properties, etc. of anti-anthrax serum with particular reference to its use in treatment of anthrax in humans. Their numerous case reports contain detailed clinical data, among the most significant of which is the isolation of the bacillus anthracis, so that there can be little doubt that the cases treated were really anthrax.

Their summary contains the following statements: fifty cases were treated, all of which were cured. The normal serum of cattle is likewise capable of protecting rabbits against virulent anthrax bacilli in the same way as immune serum. The injections of serum, from 20–50 c.c., may be made intravenously, subcutaneously, or intramuscularly. BERG.

POISONING OF CATTLE WITH HORSERADISH. W. Hackett, M. R. C. V. S. *Journ. of Comp. Pathol. and Therap.*—Reckoned by some, among poisonous plants, these properties are denied by others.

Hence the following: three cows were found dead in a grass field, at post-mortem there was found a large patch of congestion in the rumen, and the color of these parts resembled uncut beef. The anterior third of the tongue was swollen, but without marks of sloughing or irritation. In the rumen, there was a quantity of horseradish, estimated at about three-quarters of a peck. The roots varied in length from one to about four inches. The short pieces had been cut by the teeth and were about as thick as a man's thumb, the larger pieces which had not been masticated were about the thickness of a cedar pencil. None of the roots had passed beyond the first stomach. There was no other alteration in any organ of the body. The history of the cases revealed that a pailful of horseradish had been dug out of a garden plantation and placed in a ditch where the cattle were grazing. The animals' carcasses were found the next morning and the position of the cadavers suggested that they had died without a struggle. A. L.

Diffuse Leiomyoma of the Stomach and Rupture of the Organ. Veterinarian Major Cocu. *Bulletin de la Soc. Cent.*—A Percheron gelding, 13 years old, in good condition, refused his meal one morning. There were colicky pains which has subsided. His pulse and respiration were normal. He was placed under observation. Soon his condition changed. He was covered with perspiration, his respirations were accelerated and short. It seemed as if expiration was passive, and performed by the elasticity of the thoracic walls without the help of the abdominal muscles. There was no tympanitis. Auscultation at the flank seemed painful and the horse tried to resist it. The horse had an anxious expression. He died in half an hour. The only lesions were in the abdomen. Extensive peritonitis, rupture of the stomach at the middle of the great curvature. The walls were thickened to such an extent that the communication with the small intestine allowed only the introduction of the finger. The nature of the neoplasm was made that of leiomyoma. A. L.

Artificial Insemination. E. H. Riley. *Circular 63*, Agricultural Experiment Station. University of Montana.—Artificial Insemination has been practiced for over twenty years. The method increases the usefulness of valuable sires. One to a dozen mares can be bred from a single service. The vitality of the stallion is increased and more vigorous foals result. Shy breeding mares have

become regular breeders. Contagious venereal diseases may be lessened. Cleanliness is essential. Soap, vaseline, or any kind of grease should not be used as a lubricant since they lessen the life of the germ cell. Dust, cold air and direct rays of the sun should be avoided in the place chosen for breeding. Better results are secured in warm weather. No time should be lost in transferring semen to the uterus of mares to be bred, for the spermatozoa live only a short time. Semen should be kept in its container in water at a temperature from 95° to 100°. Either a capsule or impregnator may be used in artificial breeding. The capsule is a ½ ounce pointed gelatine capsule. The os is dilated before there is any attempt to use the capsule or impregnator. Avoiding the agents that destroy semen, practicing cleanliness and developing skill in operating make for success in artificial breeding.

HAYDEN.

COMPLETE FRACTURE OF THE INTERMAXILLARY BONE. Majors Moreau and Dentud. *Bulletin de la Soc. Centr.*—His mouth caught by a hook around his stall, a thoroughbred horse, unable to free himself, had made a strong effort for relief, and the result had been a complete fracture of the intermaxillary, which could be pivoted almost to a right angle from its normal situation. The case presented much difficulty on account of the nervous disposition of the horse and there was little chance to apply the proper remedy; also there was a scarcity of instruments for a surgical interference. This interference was, however, carefully attempted and followed by good results. The wound was carefully cleaned, the small loose splinters of bone removed, the fractured fragments were brought in contact, drilled and secured together by metallic sutures. A second reinforcing suture was made with the tusk and corner tooth and a light dressing, held by ribbons, was applied on the interdental space so as to add to the fixity of the metallic sutures and prevent soiling by the food. This was left only temporarily. After three weeks the metallic sutures were removed. Previous to this the feeding had been of soft and semi-liquid material and, after gradual change, consolidation was perfect and the horse able to return to its owner.

A. L.

A HORSE SHOE IN THE THIGH OF A HORSE. Major Perrie. *Bulletin de la Soc. Centr.*—A horse arrived at the front. He was 16 years old, used for the saddle and was of Anglo-Arabic breed.

He was very lame in the left hind leg, the thigh on that side had a large swelling. There was a contused suppurating wound on the mass of the ischio-tibial muscles. The wound passed upward and inward. There was another contusion of the antero-internal face of the stifle. Exploring the wounds, the presence of a metallic body was detected, perhaps a piece of obus. The extraction was made by traction through the anterior opening without necessary incision. The foreign body proved to be a newly made shoe, weighing one kilog, the heels of which were brought together. The toe only had been damaged. It was supposed that this was the result of the blow from a projectile striking the box where the shoe was and throwing it with the heels pointing forward. Recovery followed. A. L.

ARMY VETERINARY SERVICE

OBSERVATIONS ON THE CONVOY OF REMOUNTS

H. C. Crawford, ———, France.

The time is not far distant when the government of the United States will in all probability begin the shipment of large numbers of remounts to France for the American army's use in the field, and possibly it may be of interest to see enumerated a few observations on the convoy of 25,000 remounts. It is highly probable that our government will map out its programme along lines which will have for its object the rectifying of mistakes made by the several governments participating in the struggle, and in no other department is this more applicable than in the subject at hand.

The convoying of the above number enumerated was attended with varying conditions as regards weather, disease, sanitation, and general physical condition of the animals on debarkation. Of the above number of animals there was a mortality of 1130, which was 4.52%. This, however, represents the mortality on the voyages only, which generally extended over a 12–13 day period.

During the first five days after the animals were disembarked there were mortalities varying from nil to the corresponding mortality of the voyage, while in one instance brought to our attention, the death rate from the fifth to the tenth day after arrival on French soil exceeded the mortality on the voyage plus that which died during the first five days.

In a number of instances the mortality was due to the inability of the inspectors to give the animals a proper physical examination as the horses were stampeded when attempts at inspection were made, while in other instances visible symptoms of disease were rendered negative as possible by various means too numerous to mention.

It is to be expected that the animals represented varied degrees of quality and age although everything considered they were above the average. With the one exception of transports fitted in accordance with British regulations, we will state that it is practically impossible to maintain even fair sanitary conditions on board horse transports, due to the crowded conditions as every inch of space must be utilized. Through the constant shifting of the various devices for conveying air to the animals below deck and the continuous running of mechanical appliances, the purpose of which was to aerate the various parts of the ship, a fair system of ventilation and circulation was maintained.

In the transportation of remounts favorable weather conditions are a great asset though a gentle rolling of the ship is not particularly detrimental; heavy head seas causing a pitching of the boat creates the worst havoc, especially if occurring near the end of a voyage when the animals are leg weary. It was found to be far more beneficial to practise a grouping system whereby eight to ten animals were allowed to stand side by side without division boards, thus obviating an almost constant condition, namely, seborrheic eczema of the tail which invariably made its appearance in a few days due to the constant contact of that member with the back boards. Whenever animals were stalled individually this condition was present in 90% of all cases. This grouping system also prevented excessive stocking of the limbs, by allowing some freedom of movement.

It was rare to find an animal free from abrasions of some sort in the region of the forehead and poll, varying from slight contusions to conditions of fracture of cranial bones and severe infections, caused by the animal's head coming in contact with the door jams of express cars during the unloading process in transit by rail from the West. In certain instances chronic suppurative conditions such as quittor and fistulae of the withers and poll were encountered.

Although treatises on veterinary medicine mention long jour-

neys by rail or boat as being a frequent cause of laminitis, one case only was encountered in 25,000 animals, and this one instance appeared to be incited by digestive disturbances. During the first few days vertigo was occasionally met with which was very mild, requiring no medical attention.

A careful regulation of the animals' diet practically eliminated colicy affections, though gastro-intestinal catarrh was a noticeable condition present in a majority of the influenzal affections, and inducing numerous cases of mucous diarrhea which was invariably remedied by a change of diet rather than resorting to the administration of astringents. In one consignment, however, we were unfortunate in having twenty-four cases of impaction loaded on the boat in that condition, and it is unnecessary to state that irrespective of treatment they all succumbed.

There is also a marked tendency for pneumonia on board transports to assume the "hypostatic" type; the reason is obvious in view of the inactive state of the animals coupled with the unsanitary surroundings and infection. In this type of pneumonia the application of sinapisms to the thoracic walls is contra-indicated.

The pulse rate of the submaxillary or coccygeal arteries was found to be rather an inaccurate criterion as to the true condition of the heart in a great number of cases, it being necessary to auscult that organ to ascertain the true heart rate. Frequently there was a variance of three to seven beats in the pulse rate as compared with the heart beat. It can be seen that this would be rather misleading in such instances to assume that a pulse rate of 40 indicated a corresponding heart rate.

Naturally the majority of diseases encountered were influenza, its complications, the contagious pneumonias, and strangles. Purpura hemorrhagica was not met with although a few cases developed during the first month on French soil. Strangles frequently manifested itself as a diffuse purulent inflammation of the subcutaneous connective tissues and superficial lymphatics of the head. In this condition where there was a tendency to suppuration the cases as a rule recovered, but if this feature was absent they invariably died. The animals so affected presented a typical hippopotamus head. Involvment of the retro-pharyngeal, subparotid, and sublingual glands were of frequent occurrence in the strangles infections, and as is generally the case in severe influenzal outbreaks, edema of the glottis and stenosis of the bronchi prevailed.

Vesicular stomatitis was very prevalent in certain shipments, the lesions involving the tongue principally. This disease should not be confused with contagious pustular stomatitis frequently met with in English thoroughbreds imported to this country, the names of the two diseases should be self-explanatory.

Certain consignments composed of numbers of pregnant mares in which influenza assumed a very virulent role aborted at varied periods of gestation, and premature births were by no means a rarity. Parturient eclampsia in the mare was also met with.

The greatest mortality occurred among animals that had previously been affected with influenza or contagious pneumonia and had not been allowed the proper period of convalescence. The fallacy of shipping animals in such condition was amply demonstrated by the apoplectic type of death which marked a large number of the animals' demise.

Although being fed on a rather restricted grain ration a large number of animals gained considerable weight during the trip, while others shipped badly and lost from 100 to 200 pounds.

Horses loaded showing clinical symptoms of strangles ship far better than those with pronounced symptoms of influenza.

Ophthalmia with marked effusion of lymph into the anterior chamber of the eye was an almost constant symptom in the severe outbreaks of influenza which, however, cleared up nicely without therapeutic medication and leaving no sequellae. While quite a large number of animals that were placed on board with pronounced symptoms of influenza died on the voyage, the large percentage dying on French soil, during the first five day period, were placed aboard ship in this condition, contagious pneumonia included. If feasible, and possible of execution, it would stand the government in excellent stead to ship acclimated horses only, commandeering these if necessary and replacing them by green horses.

Throughout 1916, during which period the infections in question were most widespread and virulent, it was not uncommon to receive such a large percentage of animals in the period of incubation, and exhibiting clinical symptoms of the disease, that upon arrival in France with shipments of 1000 to 1200 head, from 10 to 20 per cent necessitated being sent to the infirmary and a like percentage to convalescent corrals.

Before taking up the topic of contagious pleuro-pneumonia, which by the way, is one of the greatest scourges to the remount

department, we wish to mention a practical bacteriological fact which we assume was responsible for the clinical picture met with. Following out the bacteriological hypothesis, namely, the increase in virulence up to a certain point and subsequent attenuation of organisms when passing through susceptible individuals, we will summarize the clinical aspect of contagious pleuro-pneumonia of horses as witnessed by us since December 1914.

It is quite evident to the majority of practitioners, that it borders upon the impossible, at times, to make a differential diagnosis between the first cases of contagious pneumonia encountered in an outbreak and influenza.

We have been impressed with the fact that contagious pleuro-pneuomnia of horses has a marked tendency to make its initial appearance as an atypical condition, manifesting itself as a systemic infection without pectoral localization, yet in a few days a horse, or series of horses, a short distance from our first case, which was apparently a case of influenza, manifest upon auscultation and percussion a typical pneumonia of the lobar type which it is quite evident to us has been contracted from the animal apparently afflicted with influenza. The organisms are now increasing in virulence and in their passage through the various susceptible animals, and in a few more days another series of cases manifest their appearance, which upon clinical examination reveal the fact that their condition is indisputably one of contagious pleuro-pneumonia, the involved lung, however, is affected with a lobular pneumonia which is catarrhal in type.

The virulence of the infection is now at its height, the mortality is high, the pleura is involved and effusion is pronounced. This phase of the disease represents a malignant form of pneumonia marked by lysis in contra-distinction to the preceding clinical manifestation which was marked by crisis, favorable termination of the ailment in the majority of cases and benign course.

At this point mixed pneumonia may be encountered, whereby a portion of the lung may show areas of lobular involvment while other portions have a typical lobar affection. There are also instances where the lobar involvment is so diffuse as to closely simulate a typical lobar pneumonia.

The majority of practitioners at this stage are grasping at every straw, they begin to assume that there is some "new disease" present with which they have to deal, they eagerly try various bio-

logical products that are on the market, only to find that none of the said biologics substantiate any of the claims made for them by their respective manufacturers. Every heart stimulant in the pharmocopeia receives a trial, and possibly the veterinarian confides in a fellow practitioner that he is up against it, and his friend advises a trial of various prescriptions that have stood him in stead in apparently similar instances, but all to no avail as the mortality remains unchecked. By this time a few of the patients have survived, emaciated physical wrecks. The trouble, however, is not under control as numbers of other animals are showing symptoms of approaching sickness, and in a day or so new cases of contagious pneumonia have made their appearance; the veterinarian in attendance is about ready to throw up the sponge as apparently the cases will go the way of their predecessors, but physical examination reveals the fact that the pneumonia has assumed the lobar type, it is a croupous, benign pneumonia marked by crisis, and in the majority of cases by recovery.

The virulence of the organisms has now become attenuated, and the tension under which the veterinarian was laboring relaxes, he is not out of his difficulties, however, as new cases still daily make their appearance; these, however, fail to reveal any involvment of the pectoral organs, and the unsuspecting practitioner may assume that he is dealing with influenza; this, however, is not the case, the animals in question are affected with contagious pleuro-pneumonia which is atypical in form, i. e., there is no involvment of the pectoral organs, at least in so far as we can ascertain by resorting to percussion and auscultation.

The disease as it now presents itself differs from the initial manifestation of the outbreak not one iota in so far as the clinical picture that the animal presents is concerned, it resolves itself merely into a question of the organisms being in the descendency as regards their virulence rather than in the ascendency. They are now markedly attenuated, due to the fact that they have passed through so many individuals; the remaining sick animals will usually make an uneventful recovery.

One of the greatest handicaps under which we labor in the successful control of the maladies in question, is, how long does a horse which has made an apparent recovery from one of the diseases in question still constitute a source of infection for susceptible animals with which he comes in contact? Enlightenment upon

this point would enable the practitioner to control one of the chief mediums through which these diseases spread.

A few words in reference to the disrepute "tapping" horses, having pleuritis with effusion, so-called "hydrothorax", have fallen into, might not be out of place. The success with which one meets in the performance of this operation will depend to a great extent upon the character of the exudate, if the exudate is serous or serofibrinous, "tapping" will be followed by favorable results, but if empyema is present as an accompaniment which is generally the case, the operation will not be attended by a favorable outcome.

We will frankly state that the use of biological products in the treatment of these various infections is unattended by favorable results. A supportive and eliminative form of treatment coupled with good nursing, sanitary surroundings, small quantities of a variety of palatable foods, green stuffs and herbs in season, the occasional scalding of pails, buckets, and mangers, and lastly a daily grooming of the patient where possible constitute rational lines of treatment. Furthermore if animals refuse to eat the proffered food, immediately remove same from their sight and an abundance of fresh water should be kept within easy reach of the patient at all times. Daily removal of bandages and massage of the animal's limbs before readjusting same is not without value. During extremely warm weather frequent sponging of the head, anal, perineal, and genital regions is very refreshing to the patients.

Lastly, there is no drug, combination of drugs, active principle, or combination of active principles, whether administered per orem, subcutaneously, intravenously or intramuscularly, that will effectively combat cardiac toxemia which induces the various fatal cardiac phenomena in the influenzal infections and contagious pneumonias of the horse.

The fact was also ascertained that animals in the period of incubation of the influenzal affections are not suitable subjects for the ophthalmic mallein test, and if said test is carried out an apparent typical reaction may be interrupted. If such animals are destroyed the most searching post-mortem fails to reveal glanders lesions, and in addition if checked up with guinea pig inoculation the results will be found to be negative.

—Lieutenant W. H. Lynch, who has been stationed at Boxford, Mass., has been transferred to Newport News, Va.

—Lieutenant J. A. Austin, formerly of Fulton, Ky., is now stationed at the Remount Station at Camp Shelby, Hattiesburg, Miss.

—Dr. J. Stotchik has been appointed Second Lieutenant in the Veterinary Officer's Reserve Corps. He is attached temporarily to the 21st Field Artillery at Leon Springs, Texas.

—Dr. A. Freer of Ellenville, N. Y. is with the Veterinary Reserve Corps, "Somewhere in France".

—First Lieutenant D. B. Leininger has been transferred from the 7th Cavalry, Fort Bliss, Texas to the Department of Hippology, Mounted Service School, Fort Riley, Kans.

—Dr. C. R. Boshart of Lowville, N. Y., Dr. A. W. Combs of Brooklyn, N. Y., and Dr. R. A. Halsey of Islip, N. Y., are with the Veterinary Reserve Corps, "Somewhere in France".

—Dr. Max Danziger of the N. Y. City Department of Health has received a commission in the Veterinary Reserve Corps.

—Dr. A. T. Baezler, formerly of the N. Y. City Department of Health, but now in the Veterinary Reserve Corps, has been assigned to duty at Camp Dix, Wrightstown, N. J.

—Dr. P. V. Weaver of Glen Cove, N. Y. and Dr. Stark of Brooklyn are in the Veterinary Reserve Corps.

—Lieutenant W. F. Nolechek, formerly of Thorp, Wis., is now stationed at the Remount Depot, Belair, Ga.

—Dr. J. C. Exline, who has been in charge at the Bureau Station at Walla Walla, Wash., has been appointed Captain of Battery A, Washington Field Artillery at Camp Greene, Charlotte, N. C.

—Dr. C. J. Marshall, State Veterinarian of Pennsylvania, Secretary and Executive Officer of the State Livestock Sanitary Board, has received a commission as Major and has been granted a leave of absence. He will devote all of his time to the U. S. Army Veterinary Service. Dr. T. E. Munce has been appointed Acting State Veterinarian and Executive Officer of the Board during Dr. Marshall's absence.

—Captain A. H. Hunter of the Canadian Army Veterinary Corps is Veterinary Officer at a large hospital at Havre, France.

—Dr. R. M. Staley has been commissioned Major and Dr. William Brod, Lieutenant, in the Veterinary Service. They have been granted leave of absence by the Live Stock Sanitary Board of Pennsylvania.

AMERICAN VETERINARY MEDICAL ASSOCIATION

CHAIRMAN'S ADDRESS

Section on Sanitary Science and Police

J. G. Wills, Albany, N. Y.

As this meeting is the first under the division of the association into distinct sections it has been thought fitting that the chairman of each should make brief addresses to the members thereof.

Since the last gathering of this organization our nation has entered as an active participant into military and commercial alliance with other powers against a common enemy. The ultimate outcome will doubtless be decided quite as much through industrial and commercial supremacy as by destructive agencies.

We have seen, from time to time, figures estimating the quantity of food stuffs, clothing and other materials which are annually disposed of as waste, which run into the millions of dollars. It is said that much of this is avoidable if proper attention and care is exercised. These channels by which material of value is allowed to become useless affect every industry and every line of business. The greatest source of the nation's wealth lies in its agriculture and animal industry forms one of the most important sub-divisions in this great business. Not only are vast quantities of foods, some of them practically indispensable, provided by this branch of agriculture, but our livestock directly or indirectly affects countless manufacturing enterprises and commercial pursuits. Any means whereby animal industry may be fostered and promoted produces stimulating effects upon widely diversified interests.

At this time when every effort is being made to conserve the resources of the country it is particularly important that preventable diseases in livestock be limited. The vast toll annually exacted by tuberculosis, hog cholera, infectious abortion, influenza, Texas fever and other infectious diseases is to a certain extent a reflection on modern sanitary police. For decades efforts have been directed to reduce these great economic losses in animals, yet with the exception of Texas fever and possibly hog cholera we can scarcely feel elated over progress made.

This association has aided very materially in developing means for combating those diseases and providing adequate methods of control. Unfortunately in several of our most important maladies

it has so far been impossible to find any practical procedure that has proven entirely satisfactory .

The problems that logically come under the Section on Sanitary Science and Police are no doubt of more interest to the sanitarian than to the veterinarian in active practice. Control over transmissible infections, however, touches all phases of veterinary science and indirectly reaches many other activities in comparative medicine. The limitation and eradication of most animal diseases also have a direct influence on the suppression of mortality in the human family. Furthermore, at this time the expense and effort involved in the control of such plagues is of unusual importance.

It has been our endeavor to provide in this program a sufficient range of subjects to touch briefly at least the principal phases of sanitary science and police. The object has been to confine papers to the most important questions and to place the greatest stress upon those which affect our larger domestic animals. Several recommendations and suggestions have occurred to us as advisable in connection with the future arrangement of this section. Papers should be prepared sufficiently in advance to enable the secretary to furnish copies of same to each individual who is expected to take part in the discussion. This, to a certain extent, is imposing a greater obligation upon the contributor as it necessitates his preparing additional copies of his paper and will require preparation longer in advance. The advantage, in papers being in the hands of persons entering into discussion before hand, is very evident. Much time is saved and needless repetition avoided when an opportunity is given to the person discussing the paper to familiarize himself with it and prepare his remarks accordingly. It is suggested that the number of papers to be presented during one session of this section should be limited. This will avoid over crowding, insure sufficient time and eliminate the necessity of attempting to make room for contributors who may have papers to present. Embarrassment is certain unless some such arrangement is made since some feel that it is purely a matter of volition on the part of the officers of the section whether volunteer contributions shall or shall not appear.

The suggestion is made that this section consider the adoption of a uniform policy as to the main subjects that should be presented. It is evident that the chairman and secretary would be

greatly aided if, at each meeting or by correspondence thereafter, suggestions be made as to what matters should be taken up at the next annual session. This of course would not cover the entire program but would give the officers of the section some idea of what subjects or discussions are of most interest or most desired by the members of the section.

The time limit on papers provided in the constitution is important and should be strictly adhered to. It is impossible to give contributors equally proper attention unless uniform arrangement as to time is provided for. It is likewise suggested that a general request be sent, possibly through the general secretary's office, in reference to contributors submitting or volunteering subjects for consideration. While this would necessitate the officers of the section being compelled to refuse some contributors opportunity to appear, it would at the same time give them a much wider range of selection. Under the present arrangements some of those invited to contribute do not wish to do so and the preparation of the program is accordingly more arduous.

CHAIRMAN'S ADDRESS

Section on General Practice

T. H. Ferguson, Lake Geneva, Wis.

I consider it an honor and a privilege to be permitted to say a few words to you at this our opening session of the section on general practice of the 54th annual meeting of the A. V. M. A.

Since their election it has been the effort of the officers of this association to make this the largest and most successful meeting of practitioners ever held and judging by the mangificent attendance here this afternoon their efforts have not been in vain.

The committee on this section has endeavored to prepare a program for you that would be not only entertaining and instructive, but along the needs of the day and while it is necessarily limited as to the quantity of subjects I think it will keep us busy during our alloted time.

The field of the practising veterinarian of the present day, is so broad that it can be barely touched on in the few hours we have at our disposal; nowadays it is necessary for the country prac-

titioner to have a broad knowledge on everything pertaining to veterinary science and husbandry and those possessing such knowledge eventually become identified with the social and political affairs of their community and are chosen to fill offices of importance and trust.

The husbandman is fast becoming better educated, is keeping better stock and more of it and his demands on the veterinarian are becoming more intensified, and the country practitioner that does not respect these demands and keep abreast with the times will soon find that his services are not wanted.

The ways open to a practitioner for increasing his knowledge are many. There are available up to date veterinary works covering the different subjects up to the light of present knowledge. We have our veterinary journals, our agricultural papers, our postgraduate courses, our veterinary associations where we come in direct contact with each other and by so doing and exchanging experiences gain knowledge we could get in no other way, and if we take advantake of these opportunities and apply to them untiring energy day by day we will fulfill requirements.

At our meeting last year the chairman of the section on general practice stated that two important things had been accomplished by the profession in 1916; one was the stamping out of foot-and-mouth disease and the other the recognition, by the government, of the veterinarian in the army service. I do not presume any of us realized, at that time, their full importance, but think what a calamity it would be if our country now, when she could most ill afford it, had foot-and-mouth disease to contend with, and it would be almost a tragedy if veterinarians who are taking up army work had no rank.

The practitioners' part in the above accomplishments clearly demonstrate their importance as a factor in preventing the spread of contagious diseases and their extermination.

The tuberculosis-free herds that we have at the present time are largely due to your efforts. If you receive your just due not a state in the union would refuse your properly approved certificates of health, as it is, only two or three turn you down.

If the practitioner who is in touch with the local situation and has an almost personal acquaintance with the animals to be passed on and has shown himself true blue as evidenced by his standing in his community, and with the sanitary authorities of his state,

is not in a position to pass on the health of these animals, who is?

The year 1917 will go down in veterinary history as one giving the veterinarian his biggest call.

The food problem will play an important part in winning this war; in fact it may decide it and the country practitioner is in a position to do more to help in the conservation of the food supply of this country than any other man. His every day work brings him in contact with the food producer and it is his duty as a patriotic veterinarian to help the farmer in every way possible and the ways are legion.

I could not begin to tell you what your opportunities are in your own community, every one must work them out for himself.

In behalf of the committee on general practice I wish to thank those gentlemen who have so kindly made the program for this section possible.

REPORT OF THE COMMITTEE ON INTELLIGENCE AND EDUCATION

Your committee begs leave to submit the following report:

The present is a critical period in the history of American veterinary education. As a profession we are called upon to supply veterinarians for the army service on the same basis as the medical profession, and it is a fundamental requisite that the veterinarian shall have the same training, not only in professional lines, but in all other lines that are recognized as fundamental to all learned professions.

The veterinarian in the army will be associated with thoroughly trained men, not only in medical but in other technical lines. It is therefore self-evident that the veterinarian, if he is to meet these requirements, must have a broad preliminary, as well as thorough technical training.

It is unfortunate that some veterinary colleges have not made the progress in the last few years that the times demand, in spite of repeated recommendations from this committee. The time has now arrived when definite action must be taken. These schools must improve materially in order to receive the approval of the association.

During the past year all of the veterinary schools, with the exception of four, have been visited by one or more members of this committee. We have found that a number of schools are not con-

ducted in a manner that will reflect dignity upon the veterinary profession, nor are they in keeping with the modern standards of education. The buildings are untidy, there is a lack of discipline, and the instructors in many instances are inefficient and fail to recognize their responsibilities as teachers of a learned profession.

The entrance requirements in many cases are not strictly enforced. These conditions have been repeatedly called to the attention of the authorities concerned, but they have not been remedied.

The committee believes that the time has come when definite action should be taken with reference to some of these schools.

We recommended that the San Francisco Veterinary College and the United States College of Veterinary Surgeons be dropped from the list of accredited schools.

We have also decided to advise three other schools that unless certain definite improvements are made before the 1st of January, 1918, to conform to the standard requirements set by this association, that they be dropped from the list of accredited schools.

The Arkansas Veterinary College has been visited, but owing to the lack of the most of the essentials of a veterinary school we recommend that this institution be not recognized as an accredited school.

The usual confidential reports will be made to other schools calling attention to deficiencies, which in the opinion of the committee should be adjusted.

Respectfully submitted,

N. S. MAYO
R. C. MOORE
LOUIS A. KLEIN.

SALMON MEMORIAL FUND

The Salmon Memorial Fund Committee has been less active the past year owing to the great demands on our members for so many organizations seeking help for the sufferers in Europe within and without our profession.

Scientific organizations of all kinds have made many appeals to the profession, Red Cross, Blue Cross, Red Star, Liberty Bonds, Home Defense and kindred organizations have made the most strenuous calls for help that one or two special state appeals brought so little response that it seemed wise not to inaugurate plans that

called for the expenditure of considerable sums of monies for clerical services, postage, travelling expenses, etc.

Many of the unpaid subscriptions of last year remain unpaid and leniency has been asked by these subscribers until there would be some lessened demands for monies along other lines.

The amounts subscribed and collected for the past year total $908.50.

Several amounts of monies collected by state organizations are not yet turned into the committee's hands.

One subscription of eight hundred dollars was made subject to call when the fund reached ten thousand dollars.

The amount in bank is $2056.10; the total subscribed has reached $4086.61.

SALMON MEMORIAL CONTRIBUTORS

New York State	$ 574.00
Iowa	472.61
Pennsylvania	445.00
Illinois	235.00
Michigan	225.00
Ohio	220.00
Massachusetts	209.00
New Jersey	146.00
District of Columbia	145.00
Wisconsin	131.00
Minnesota	72.00
Connecticut	71.00
Virginia	51.00
Missouri	50.00
Montana	33.00
Canada	26.00
Washington	25.00
California	25.00
Indiana	25.00
Nebraska	25.00
Louisiana	25.00
Mississippi	20.00
Colorado	16.00
Maine	15.00
South Carolina	5.00
Swift & Co.	800.00
	$4086.61

REPORT OF THE INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS

To the President, American Veterinary Medical Association,

Sir:—I have the honor to submit the report for the past year of the International Commission on the Control of Bovine Tuberculosis.

The only meeting held during the year took place at Chicago, Ill., on December 4th, 1916, the following members being present: Doctors V. A. Moore, J. R. Mohler, F. Torrance, E. C. Schroeder, Mr. J. H. Grisdale and the Chairman. A communication was received from Doctor M. H. Reynolds, Secretary of the Commission, stating that he was unable to attend the meeting because of illness. Doctor Schroeder was therefore elected to act as secretary pro tem.

The minutes of the last meeting having been read and approved, a general discussion took place as to the future of the commission.

It was pointed out that since the publication and distribution in the United States and Canada of the original reports of the commission in the year 1910 and the issue in 1911 of the Primer on Bovine Tuberculosis, the commission had been maintained merely as a consultative body empowered to take up and deal with any new phases of the question which might from time to time arise.

The recommendations embodied in the publications above referred to have been remarkably free from criticism either by members of the profession or by others interested in the subject. Since their issue but little new has been discovered in regard to the disease, while no work of a general and comprehensive nature in the direction of its control and eradication has been undertaken by governmental bodies, either on this continent or elsewhere.

It was agreed that, in view of these conditions, it was inadvisable to any longer continue the existence of the commission as at present constituted.

It was felt, however, that the great importance of bovine tuberculosis from an economic as well as from a professional standpoint, made it desirable that the American Veterinary Medical Association should appoint a special committee to which all questions relative to this disease should be referred, and which would act as the official exponent of the views of the veterinary profession of America on the subject.

The suggestion was also made that a similar committee might be created by the United States Live Stock Sanitary Association, In the event of this being done, it would appear desirable that these two committees should work together with the view of preventing the possible expression of conflicting opinions likely to confuse the public mind on this important question.

The members of the commission were of the opinion that besides maintaining a close watch on all possible future developments in regard to bovine tuberculosis, including further inquiry into and observation of the various more recent methods of applying the tuberculin test, committees such as those above suggested would be better fitted than the commission, as at present constituted, to carry out the work outlined in its last report, namely, that of correlating the technical knowledge of bovine tuberculosis with measures of practical control.

It will be remembered that this suggested program comprised the working out of an effective scheme for the co-operation of federal, state and other authorities in following to the point of origin tuberculosis infection revealed by official inspection of meat-producing animals before or after slaughter.

It also referred to the possibility of important service in furthering such lines of work as the official recognition and registration of tuberculosis-free herds of pure bred cattle.

At the conclusion of a general discussion in which all the members present participated, the following resolution was unanimously adopted:

> "As the International Commission on the Control of Bovine Tuberculosis realizes that its main work has been completed and sees no special reason for the continuance of its existence, it requests the American Veterinary Medical Association to relieve it of its duties. The commission suggests the appointment of a small committee which can advise the association in all matters concerning tuberculosis."

I would respectfully urge, on behalf of the commission, that the American Veterinary Medical Association should take action in accordance with this resolution.

Respectfully submitted,

J. G. RUTHERFORD, Chairman,

International Commission on the Control of Bovine Tuberculosis.

REPORT OF THE COMMITTEE ON REVISION OF VETERINARY ANATOMICAL NOMENCLATURE

In view of the fact that the report of the committee of last year was not brought before the association and hence was of course not acted upon or printed in the *Journal*, it seems proper to present it herewith in order that the association may be aware of the situation. The report was as follows:

"Your committee regrets to state that it has been unable to make any progress during the past year. It is only fair to say that the committee is in no way responsible for this unfortunate situation, which is due to the fact that the list of terms presented in the last report had not been published as ordered by resolution of the association. The committee therefore could not carry out its intention of obtaining from the anatomists of the association statements of their views concerning the names proposed by the committee. The so-called report which appeared in the February number of the *Journal* of the association was merely the letter of transmittal, appended to which were several names which had been inadvertently omitted from the previous report. It is evident that a matter of this kind cannot be dealt with in an intelligent manner without publication of the entire report and an opportunity for a referendum to anatomists outside of the committee previous to final action. We therefore recommend that the report be printed and that the committee be continued and authorized to obtain the views of their colleagues in order that the whole matter may be put in final form for submission to the association."

It seems unnecessary to add much to the foregoing statement. The present committee endeavored to make some progress by conducting a referendum of the anatomical teachers of the country with regard to the partial list of terms published in the proceedings of the association of 1913. The result indicated either satisfaction with the names proposed by the committee or indifference to the matter. We repeat the recommendations made by the committee of last year.

Respectfully submitted,

SEPTIMUS SISSON, Chairman.

H. S. MURPHEY
E. S. BRASHIER
S. L. STEWART
I. E. NEWSOM

REPORT OF THE AUDITING COMMITTEE

Members of the A. V. M. A.:

The committee on Audit has carefully gone over the books of the Secretary-Treasurer and makes the following report:

We find the association funds divided into:

1. Association fund—one-half dues and initiation fees.
2. Journal fund—subscriptions from non-members.
   Advertisements.
   One-half dues and initiation fees.
3. Salmon fund—Reported by committee at meeting as to disposition of funds.

We carefully examined the report of the Secretary, Editor and Treasurer, checking each item that appears in the report with bill voucher and cancelled check. We find the receipts of the A. V. M. A. are: $11,599.03

Expenditures 9,330.68

Balance .....$ 2,268.35

This was verified by the adding machine and certified by the cashier of the Tenth National Bank.

REPORT OF JOURNAL FUND. We find the receipts from Dec. 26, 1916 to Aug. 6, 1917, the time the association treasurer has disbursed the funds to be:

Receipts $9,472.51
Expenditures 7,697.99

Balance $1,774.52

verified as above mentioned.

The Journal fund as reported by the editor, covering two periods, was carefully looked over and found correct as submitted. One period covered by the audit of the treasurer; the other period covered by the editor and extending in periods covered in the dates given on the attached examination; August 1, 1916 to December 31, 1916.

RECEIPTS

Balance August 1, 1916.....	$ 810.57
Subscriptions, advertisements, etc.....	2335.50
Received from treasurer.....	700.00
	$3846.07

EXPENDITURES

Printing Journals, etc.	$2652.18
Remitted to treasurer	1193.89
	$3846.07

Auditing Committee: A. S. COOLEY, Chairman
W. H. ROBINSON
G. B. MCKILLIP
E. M. RANCK.

ASSOCIATION MEETINGS

HUDSON VALLEY VETERINARY MEDICAL SOCIETY

Meeting called to order by the president, in the rooms of The Chatham House, Chatham, N. Y.

The minutes of the previous meeting were read and adopted.

The Secretary reported that the case of N. E. Rice, which was before the Regents for their endorsement of his "Certificate of facts" whereby he could register, was acted upon favorably by the Regents. This case had not only been opposed by this society but also by the State Society. The reason that this case met with such opposition was on account of the fact that Dr. Rice was only about 14 years old when he claimed that he was practising with his father who at that time was an illegal practitioner.

Drs. Wills, Fish, Luff and Faust made some remarks upon this case.

New Business. Dr. Wills spoke upon some of the recent changes in the Agricultural law, especially affecting the Bureau of Diseases of Animals.

1st. On and after July 1, the tuberculin test was not compulsory. If a test was made a record of the same had to be kept and to be furnished to the Department of Agriculture upon request.

2nd. It was compulsory to report all reactors, also all cases of communicable diseases.

3rd. The law provides for a physical examination.

4th. Compensation to owners for animals ordered killed by the order of the Commissioner of Agriculture had been changed from 80 to 90% for localized cases and from 50 to 25% for generalized cases.

5th. It was not necessary to brand reactors.

6th. The Bang method was still recommended.

7th. Hogs and calves may be fed milk from reactors, provided that the milk be heated for 30 minutes to 145 degrees and that the animals so fed be killed under inspection.

8th. The Bob veal law had been changed from 4 weeks to 3 weeks.

9th. The expense for the control and eradication of rabies had to be paid by the state.

The meeting was then opened for the report of cases.

Dr. Luff reported a case in which the temperature was 102 degrees to 105 degrees, respiration 45 to 60. Had all appearances of congestion of the lungs. Regular fever treatment was given for a week with no improvement. Changed treatment to sodium cacodylate and potassium iodide. This treatment was given for 3 months when the temperature dropped to 102 degrees, respiration 25 to 35.

Dr. Smith reported a case of peculiar lameness in a dog's right hind leg.

Dr. Anderson reported a case in a dog, lame and sore in both hind legs.

Dr. Kehr reported a case of mammitis in a mare in which the formalin treatment was given.

Dr. Sheldon reported 3 cases of agalactia which were treated with pilocarpine and nux vomica. He also reported that he had used injections (hypodermic) of the animal's own milk. Beginning with 10 c.c. and increasing to 40 c.c.

Dr. Harris made some remarks on lymphangitis.

Dr. McCormick was called upon but did not make any remarks.

Dr. Schultz reported a case which Dr. N. E. Rice had castrated and the following day he was called to put back the intestines. The horse died.

Dr. DeWitt reported the pulling out of the omentum by the patient's own teeth after castration.

Dr. Faust reported two cases in which, after castration, the intestines came out.

Dr. Faust reported a case in a work mare that was bloated, showed colic pains and the rectum was open after she had been served by a stallion.

Dr. Thompson reported a case.

Dr. Fish was called upon for some remarks and spoke upon the Belgian relief fund.

It was regularly moved and seconded that $25 be appropriated towards this fund and that the secretary be authorized to pay this amount over to Dr. Fish. Carried.

It was regularly moved and seconded that the next meeting be held at Millbrook, November 7, 1917. Carried.

Moved to adjourn. Carried.

WM. HENRY KELLY, Sec'y-Treas.

SOUTHEASTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The regular quarterly meeting of the Southeastern Michigan Veterinary Medical Association was held at the Griswold Hotel, Detroit, on the afternoon and evening of October 10, 1917. About twenty members and visiting veterinarians were present. Five new members were admitted to membership, bringing the roll of members up to thirty-six.

Dr. M. C. Hall read a very interesting paper entitled, "Anthelmintic Treatment for Nematode Infestations in Dogs." Specimens of the more common nematodes found in dogs in Detroit and vicinity were exhibited by Dr. Hall. The reading of the paper was followed by a very interesting discussion.

Mr. H. H. Halladay, President of the Michigan State Live Stock Sanitary Commission, addressed the meeting on the subject of the compensation allowed owners of tuberculous cattle, under the new law.

Dr. E. P. Schaffter, Inspector in Charge of the Detroit Branch of the Bureau of Animal Industry, gave a brief talk on the subject of meat inspection. During the coming year Dr. Schaffter will present papers on recent improvements and refinements in meat inspection work, as well as a paper on the utilization of animal by-products.

Dr. H. E. States, of the Detroit Board of Health, was unable to present his paper on Milk Inspection, and in his place Dr. H. Preston Hoskins was asked to give an account of the Kansas City meeting of the A. V. M. A., as only a few of the members had been able to attend the convention.

A rather unique plan for supper was adopted at this meeting.

The afternoon session was called to order shortly after 4 o'clock, and adjournment for supper took place promptly at 6:00 P. M. The Griswold Hotel recently installed a very fine cafeteria and discontinued their dining room. For our use the manager of the hotel reserved one of the alcoves in the cafeteria at 6:00 o'clock. Each member took a tray and secured whatever he felt like eating, and in less than fifteen minutes we were all seated in the alcove with our suppers before us. At 7:00 P. M. President Joy called the evening session together.

This plan promises to work out well. The membership being made up of both city as well as out-of-town members, some can attend only the afternoon session, while others can attend only in the evening. The supper hour from 6 to 7 catches some of both groups, as well as those who attend both sessions. One of the best things about this arrangement is that it is not necessary to arrange in advance to serve any specified number. It is just about as democratic as it could be.

Our next meeting will be held January 9, 1918.

H. PRESTON HOSKINS, Sec'y-Treas.

KEYSTONE VETERINARY MEDICAL ASSOCIATION

The regular annual meeting of the Keystone Veterinary Medical Association was held on Tuesday evening, October 9th, 1917, at 8:30 P. M., at the Chamber of Commerce, Widener Building. Good attendance. We had with us as visitors, Drs. Andress, O'Leary, Earle, Paxon and Tingley.

Dr. Adolph Eichhorn, of the Lederle Antitoxin Laboratories, Pearl River, N. Y., addressed the meeting. His subjects were Infectious Stomatitis of Horses and Forage Poisoning; he also discussed Blackleg. These subjects brought forth very extensive discussion by several of the members and was very much enjoyed.

This association contributed twenty-five (25) dollars to the Relief Fund for the benefit of the families of veterinarians who have gone to the war.

The annual election was held and the following officers were elected:

President, W. J. Crocker; Vice-President, L. A. Mansbach; Secretary-Treasurer, C. S. Rockwell.

Board of Censors: M. W. Drake, F. H. Schneider, C. J. Marshall, J. W. Vansant, C. M. Hoskins.

C. S. ROCKWELL, Secretary.

WEST VIRGINIA VETERINARY MEDICAL ASSOCIATION

The West Virginia Veterinary Medical Association held the best meeting in its history on July 5th and 6th at Parkersburg, W. Va.

On July 5th Dr. H. K. Wright of the H. K. Mulford Co., gave the most interesting and instructive lecture on the manufacture and administration of anti-hog cholera serum which anyone present ever heard. In the latter part of the afternoon the election of officers was held. Dr. J. J. Cranwell of Clarksburg was unanimously elected president. Dr. Ernest Layne of Huntington, W. Va., who had been the secretary and treasurer for the past two terms, was also unanimously elected. There was the largest attendance that had ever been present at a meeting, as most every graduate in the state was present and several from the neighboring state of Ohio.

Dr. L. A. Merillat, of Chicago, Ill., arrived late on the evening of the fifth and gave a very interesting talk on the latest operations. After the day's business was all over and the usual banquet was partaken of, quite an enjoyable automobile ride was taken to Marietta, Ohio.

On the morning of the sixth, Dr. Merillat, with several very able assistants, through the courtesy of Dr. Callender offering the use of his up to date hospital, started the clinic which lasted until late in the afternoon, when everyone departed for his home, declaring he would attend the January meeting. The place of the meeting was left to the executive committee to decide.

E. LAYNE, Secy.

—Newspaper reports state that an epidemic of anthrax, affecting cattle in Yolo County, California, has reached an alarming stage and has spread to an adjoining county. It is reported that the State Veterinarian feels confident the germs are being spread by agents of enemies of the United States.

—Dr. J. F. Shigley, formerly of Kenmare, has removed to Lansford, N. D.

—Dr. W. H. Hurst, formerly engaged in meat inspection at Sioux Falls, S. D., has been transferred to Sheldon, Ia., in the work of hog cholera eradication.

—Dr. James H. Hester has removed from Santa Barbara to San Jacinto, California.

REVIEWS

VETERINARY OBSTETRICS

W. L. WILLIAMS
Professor of Obstetrics and Research Professor of the Diseases of Breeding Cattle in the New York State Veterinary College, Cornell University, Ithaca, N. Y.

Six hundred fifty pages, three full-page colored plates and one hundred forty illustrations in the text. Price, $5.00 prepaid. Sold exclusively by the author.

In 1909 the author published a volume under the title of Veterinary Obstetrics, including the Diseases of Breeding Animals and of the New Born. This work was attempted to place in a single volume all the available information concerning obstetrics, diseases of the genital organs and of the new born animals. As time has gone on research work has shown that the basic knowledge underlying the work was wanting. Many new facts have been discovered which have led to an entirely different conception of various phases of the book. Furthermore, there has developed so much new material that it has been found impossible to include all of these subjects in a single volume. Accordingly the present book includes only that phase of the subject which relates directly to obstetrics.

In order to give the reader some idea of the subject matter, a brief review of the table of contents should be noted. The anatomy of the generative organs is first presented, followed by what the author calls Obstetric Physiology. The latter includes the subject of Embryology. The subject of Pregnancy is next taken up, which includes among other things, a very complete discussion of the methods of diagnosing Pregnancy. This is followed by diseases of Pregnancy, including the different types of Dystokia. The author here introduces a new name for certain forms of difficult labor which he calls the "Dystokia of Contagious Abortion". The latter part of the book is devoted to Wounds and Injuries of the Genital Organs, Puerperal Infections and Puerperal Eclamptic Diseases.

Dr. Williams' large clinical experience as well as his natural aptitude for the work has been productive of excellent results. The subject matter of this book is based largely on clinical experience. Dr. Williams, however, states that he has drawn freely from the printed discussions of other authors. The subject is very com-

pletely discussed and the various phases illuminated with actual cases.

When the author discusses those conditions in obstetrics which relate to contagious abortion, many new and exceedingly interesting facts are brought out. To certain of these, some practitioners and laboratory workers will take exception. This, however, is always the case in a new field where many of the basic principles underlying the infection are but imperfectly understood. Further work along these lines alone will settle the controversial features. Especially in this connection we wish to note what the author says concerning one of the results of feeding sterilized milk to calves and its effect on the muco-purulent discharge from the vulva. Two very striking cuts would seem to indicate that calves fed on sterilized milk would be free of this discharge. We question very much whether the infection which is induced by feeding raw milk is responsible for the matter of the vulvar tuft.

This book is one of the best that has been written for both the practitioner and the student of Veterinary Medicine. It is well illustrated, the paper upon which it is printed is excellent and the type clear cut. The subject is one in which all members of the veterinary profession should be interested. It is especially valuable to the practitioner whose work is among cattle, although its relation to the obstetrics of horses, sheep and pigs must be kept in mind. It is a very complete, up-to-date and scientific treatise on Veterinary Obstetrics. CHARLES E. COTTON, V. M. D.

EPIZOOTICS AND THEIR CONTROL DURING WAR A GUIDE FOR ARMY, GOVERNMENT AND PRACTISING VETERINARIANS

DR. HERMAN MIESSNER
Professor of Hygiene and Director of the Hygienic Institute of the Royal Veterinary College, Hanover. With thirty-seven illustrations
Translated by A. A. LEIBOLD, D. V. M.
Publisher, American Journal of Veterinary Medicine, Chicago.

In the present great war, the importance of veterinarians with the armies has been given full recognition and the profession is cognizant of its many responsibilities toward aiding the fighting forces by proper care of the animals and by controlling the disease to which they are at all times exposed. It is a recognized fact that during previous wars, dangerous infections and contagious

diseases have followed the wake of the armies, and furthermore, the fighting forces were many times hampered by outbreaks of diseases among the horses which crippled the forces sometimes at their greatest emergency.

The progress of the last decade in preventive medicine and sanitary science has enabled the veterinarians in this great war to effectively guard against threatening infections; and up to date the achieved successes of the veterinary profession command the greatest admiration, inasmuch as even the most common infectious diseases have been successfully controlled among the horses of the armies.

With the entrance of our country into the war, our profession will have to perform a great task and no doubt everyone actively engaged in the service will do his utmost toward meriting recognition and thereby aiding the profession.

The veterinary literature on army service, as it relates to experiences in this war is rather meager, and therefore "Epizootics and Their Control During War" will be welcome to those who will seek eagerly information to help them along in their new lines of duties.

The publication should prove of great value not only to army veterinarians, but also to the practitioner who desires to familiarize himself with the control of diseases discussed in the publication.

The diseases to which the animals of the fighting nations are exposed are treated by the author in a masterly fashion which include also the maladies which may be introduced as a result of invading and retreating armies. Glanders has received the greatest attention and the author has evidently recognized the importance of this disease and the necessity of army veterinarians to be fully informed with all of its phases. He describes in detail the etiology, pathogenesis, morbid anatomy, symptomatology and differential diagnosis and enters minutely into the various tests which are being now employed for diagnostic purposes. The agglutination, conglutination, and complement fixation tests are described in detail. Likewise the ophthalmic test is given very close consideration. Measures for combating the disease are also fully discussed.

Of the other diseases, Anthrax, Rabies, Mange, Influenza, Strangles, Dourine, Contagious Pleuropneumonia of Cattle, Rinderpest, have also received due attention. The chapter on disinfection, while brief is up to date and is of special value to veterinar-

ians in the army service. The appendix by Dr. A. A. Leibold on "Hints on Handling War Horses in America" gives a splendid review of the literature and experience gained by others along those lines.

The thirty-seven illustrations add a great deal to the book and especially those on glanders are exceptionally good.

The publication should prove a very valuable aid not only to the veterinarians in the army service, but also to all live stock sanitarians who are engaged in the conservation of live stock and in the control of infections diseasses. A. EICHHORN.

BOVINE TUBERCULOSIS

J. F. DEVINE, with the collaboration of E. Z. RUSSELL, D. F. LUCKEY and O. E. DYSON.

Pages 120; 7 illustrations. Publisher, American Journal of Veterinary Medicine, Chicago, 1917.

This little book has been carefully prepared so that nothing of importance is left out in the discussion of bovine tuberculosis, from an educational standpoint, whether the reader be a veterinarian, student, sanitarian, dairyman, breeder, or public health official; and it can be recommended to such with a view to supplying useful knowledge without the fear of misleading or misinforming its readers.

The book starts well with an introduction by E. Z. Russell in which he clearly shows the importance of the control and eradication of bovine tuberculosis from a purely business or economic standpoint; also as a health problem. He plainly shows how the estimated loss of about $25,000,000 yearly from tuberculosis is borne by the producers, the packers, and the consumers. The great importance of thorough and effective cööperation of health officials, with the various city and town boards of health, through the enforcing of ordinances prohibiting any milk being sold or consumed within their jurisdictions, except from cows that have successfully passed the tuberculin test, is clearly set forth.

The question of compensation for tubercular condemned animals is discussed, and various plans suggested.

Dr. DeVine goes griefly over the history of bovine tuberculosis and discusses the contributory factors in the spread of the disease; the most important being, first, "Traffic in Cattle", and

second, "The feeding of milk containing the living germs of tuberculosis to young calves". The disaster of cattle traffic is chiefly seen in large dairy herds, where it is the custom to purchase animals, frequently, in order to replace those which are not productive. This is done without any special care being taken to determine if these new animals are free from tuberculosis; and, in the second place, the danger of infected milk is often made plain, particularly in herds where it is the custom to feed the calves raw skim milk taken from the miscellaneous supply given out by creameries.

The remedy for these conditions lies in the hearty cö-operation of all concerned, in the dissemination of accurate knowledge concerning the disease, and in aiding the building up of tuberculosis-free herds, thereby making it possible for those who are seeking to purchase healthy dairy animals to find them readily available.

Under "Control and Eradication", the various methods are discussed, among these are (1)"The physical examination and immediate slaughter of all animals apparently affected with tuberculosis; (2) The physical examination and tuberculin test at the same time destroying all animals that show evidence of the disease either by the test or physical examination; (3) The rearing of non-tuberculous animals by immunization of the young; (4) The Bang method; (5) The Ostertag method; (6) Professor Poel's method; and (7) The "Modified Bang method" which would appear to be the most practical one for American conditions."

Under diagnosis the two most practical methods of determining the presence of tuberculosis in a herd are discussed; first, the physical examination, and second, the tuberculin test, either subcutaneous, intradermal, or ophthalmic.

While acknowledging that careful physical examination has much merit in reducing tuberculosis, yet I think that most men of wide experience with bovine tuberculosis will agree with the author, that an attempt to control and eradicate tuberculosis by means of physical examination alone would mean slow progress.

The lucid description of the proper methods of making and recording the various tuberculin tests, adds much interest for the reader, especially the contribution by Dr. Luckey on the advantages of the "Intradermal test", which seems to me the best description of this test that has ever come to my notice.

The contribution to this book on "The State Accredited Herd", by Dr. Dyson contains much practical advice, from an expert, on the necessity for cöoperation of the state and federal authorities in the control and eradication of bovine tuberculosis as a national problem.

The book can be highly recommended as an important contribution to public education on the subject of bovine tuberculosis.

W. Reid Blair.

NECROLOGY

JOHN ELMER RYDER

Doctor Ryder died at his home at Hollis, L. I., on Wednesday, September 19, at the age of sixty-one years, after a lingering illness. He had been professor of obstetrics, clinical medicine and cattle pathology in the veterinary department of New York University. He was a member of the American Veterinary Medical Association, New York State Veterinary Medical Society and the Veterinary Medical Association of New York County. He leaves a wife and daughter.

MISCELLANEOUS

—Dr. S. J. Huston has removed from Bagley to Jefferson, Ia.

—Dr. H. T. Graves has removed from Olympia to Puyallup, Washington.

—Dr. O. C. Mayer, formerly at Indianapolis, is now located at Noblesville, Ind.

—Dr. W. H. Dalrymple of Baton Rouge has been appointed a member of the Agricultural Advisory Committee of the Food Administration Office for Louisiana.

—Announcement has been made of the marriage of Miss Dorothy Rose Allstatter to George H. Bruns, October 10th. After November 1 they will be "at home" at Andalusia, Ala.

—Dr. W. Thompson has removed from Laredo to San Antonio, Texas.

—Dr. J. D. Adams, formerly of Genesee, Idaho, has removed to Moscow, Idaho.

—Dr. R. O. Wilson has removed from Choteau, Mont. to Dunseith, N. D.

—The Colorado Veterinary Medical Association will hold its next meeting January 24 at Denver.

—Dr. J. M. Jehle, formerly of Chicago, is now engaged in the hog cholera eradication work at Des Moines, Ia.

—Dr. J. G. Rutherford of Calgary is mentioned in the newspapers as a possibility in the new Canadian Cabinet.

—The next meeting of the Indiana Veterinary Medical Association will be held at Indianapolis, January 10 and 11.

—The Northwestern Ohio Veterinary Medical Association held its semi-annual meeting at Fostoria, October 25. Doctors Fulstow, De Tray, Axby, Fogle, Hilty, Carver, Burnett and D. S. White were on the program.

—Dr. Warren Sorrell, formerly of Willard, N. M., has removed to San Angelo, Tex.

—Dr. A. M. Wright has removed from Spencer, Ia. to Windom, Minn.

—Dr. R. W. Heise, formerly of Ames, Iowa, is now located at Dunlap, Ia.

—Dr. W. B. Davidson has removed from Windthorst to Neptune, Sask.

—Dr. F. A. McKim, formerly of Sandstone, Minn., has taken over the extensive practice of Dr. H. E. McLarin of Hector, Minn. Dr. McLarin has joined the Veterinary Reserve Corps.

—Misbranded Veterinary Preparations. The United States Department of Agriculture has investigated a number of veterinary preparations which, it is held, violate the Federal Food and Drugs Act.

In one instance, an "agricultural liniment" was alleged to be a cure for a long list of maladies, ranging from neuralgia in man to distemper and harness galls in horses. Furthermore, the label stated that the medicine was "in full compliance with pure food law." The court, however, was of a different opinion and the agricultural liniment was condemned.

In another case, a solution of camphor and carbolic acid in cottonseed oil was supposed not only to heal cuts, burns, galls and sores "in a remarkable manner", but also to act as a preventive

of whooping cough and tuberculosis. The manufacturers of this preparation guaranteed it under the Food and Drugs Act. In court they pleaded guilty to a charge of misbranding and were fined.

In the face of this evidence, Department officials point out, farmers and stockowners should use discretion in the purchase of veterinary preparations. In particular, they are warned against a common misconception of the meaning of the words "Guaranteed under the Food and Drugs Act" or some similar phrase on the label. This should not be taken to mean that the Government guarantees either the purity or the usefulness of the product; or that it conforms with the requirements of the law. What it was intended to mean was that the manufacturer guarantees to the retailer that he will assume entire responsibility in case any question arises concerning his product under the Food and Drug Act. This, of course, is no protection to the purchaser. In order to avoid misunderstanding on this point, the use of the so-called guaranty legend has been prohibited in future, although this prohibition is not to take effect until sufficient time has been allowed manufacturers to use up the stock of labels they may have on hand.

—A meeting of the Northwestern Iowa Veterinary Association was held at Sioux City, Ia., October 4. The clinic was held at the hospital of Dr. G. P. Statter. Dr. Lord, the president of the association, has entered the service of the government.

—Dr. A. J. Pistor is now attached to the meat inspection service of the B. A. I. and located at Washington, D. C.

—Dr. O. R. Burkett has removed from Topeka to Wichita, Kans.

—Dr. A. J. Farley has removed from Pomona to Los Angeles, Calif.

—QUARANTINE RELEASE. The first release of territory in Texas from quarantine on account of sheep scabies since the imposition of the quarantine against the entire state July 1, 1914, has been announced by the United States Department of Agriculture, as effective October 15. The removal of the quarantine affects 107 counties of an aggregate area of 121,451 square miles, or nearly one-half the area of the State. Systematic work for the eradication of scabies was begun in Texas by the Bureau of Animal Industry May 1 last. The work will be continued with a view to releasing the other portions of the State from quarantine as fast as they are freed from the disease.

Because of the widespread existence of scabies the United States Department at one time had under quarantine Texas, New Mexico, Colorado, Wyoming, Montana and all States to the West. From time to times States and portions of States to the East were also under quarantine. The disease has now been brought under control to such an extent that the quarantine has been raised from most of this territory. After October 15 there will remain under quarantine only 10 counties in California and the portion of Texas not included in the release just announced.

—UNITED STATES CIVIL SERVICE EXAMINATION. Veterinarian (male) Bureau of Animal Industry, $1,400 a year. Applicants must have graduated from a veterinary college of recognized standing or be senior students in such an institution and submit proof of actual graduation within six months from the date of the examination. Applicants must have reached their twenty-first but not their forty-first birthday on the date of the examination.

—Dr. Skerritt of Utica, N. Y. recently removed a seven-inch hat-pin from a three-month's old Boston terrier.

—Lieut. C. W. Likely, formerly of Aukeny, Ia., is now with the 341st Field Artillery, Camp Funston, Kans.

—Lieut. John G. C. Nash, formerly of Pella, Ia., is now with the 340th F. A. N. A., Camp Funston, Fort Riley, Kans.

—Sivert Eriksen, formerly of Kensal, N. D., is now at the Remount Depot, Camp Dodge, Ia.

—Lieut. Emlen Wood has been relieved from duty with the 1st Penna. Cavalry and appointed Division Veterinarian at the 28th Division Headquarters, Camp Hancock, Augusta, Ga.

—Second Lieutenant H. E. Eakins, formerly of Fort Collins, Colo., is not with the 115th Field Signal Battalion at Camp Kearny, Linda Vista, Calif.

—Dr. H. F. Nimphius, New York City, attached to the Second Battalion, Second Field Artillery, National Guard, New York, has been called into service for his country.

—The war need for government stenographers and typewriters is urgent.

—Liberty Loans are Life Savers.